ORDER NO. KM40108850C3

Service Manual

Telephone Equipment

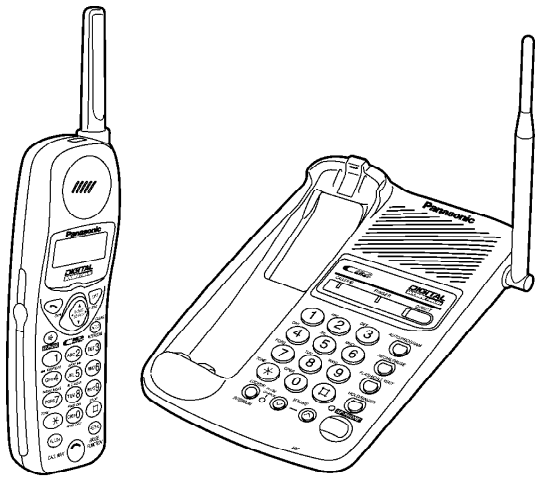
Caller ID Compatible

KX-TC1713BXB

900MHz Digital Cordless Phone

Black Version

(for Asia, Middle Near East and other areas)



(Handset) (Base Unit)

SPECIFICATIONS

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	Base Unit	Handset
Power Source:	AC Adaptor (KX-TCA1BX)	Rechargeable Ni-Cd battery
Receiving Frequency:	22 channels within 902.00~928.00 MHz	22 channels within 902.00~928.00 MHz
Receiving Method:	Double super heterodyne	Double super heterodyne
Transmitting Frequency:	22 channels within 902.00~928.00 MHz	22 channels within 902.00~928.00 MHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Tolerance of OSC Frequency:	4.096 MHz	4.096 MHz
Modulation Method:	TDD-FSK	TDD-FSK
Spread spectrum Method:		
Chip rate		
ID Code:	28-bit	28-bit
Dial Mode:	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse
Redial:	Up to 32 digits	Up to 32 digits
Speed Dialer:	Up to 22 digits	
Power Consumption:		14 days at Standby, 6 hours at Talk
Dimension (H × W × D):	3 $^{11}/_{32}$" × 7" × 8 $^{1}/_{4}$" (85 × 178 × 210mm)	1 $^{5}/_{8}$" × 2 $^{5}/_{32}$" × 9 $^{7}/_{16}$" (41 × 55 × 240 mm)
Weight	0.99 lbs. (450 g)	0.49 lbs. (220g) with battery

Design and specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

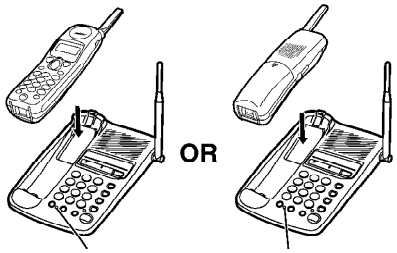
ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.

1. STANDARD BATTERY LIFE

Battery Charge

Place the handset on the base unit and charge for about **15 hours** before initial use.

• The IN USE/CHARGE indicator lights.



IN USE/CHARGE Indicator

Battery strength

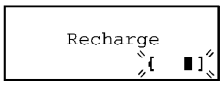
You can check the battery strength on the display while the handset is on the base unit, while it is in use (making/answering a call etc.), or after viewing the Caller List, or directory items, programming, etc.
The battery strength will remain on the display for a few seconds after using the handset, then the display will return to the standby mode.

The battery strength is as shown in the chart below.

Display prompt	Battery strength
[▮▮▮]	Fully charged
[▮▮]	Medium
[▮]	Low
[▮] (flashing)	Needs to be recharged.

Recharge

Recharge the battery when:
– "Recharge" is displayed,
– "{ ▮]" flashes on the handset display, or
– The handset beeps intermittently while it is in use.



• If you DO NOT recharge the handset battery for more than 15 minutes, the display will keep indicating "Recharge" and/or "{ ▮]" will continue to flash.

Battery information

After your Panasonic battery is fully charged;

Operation	Approx, battery life
While in use (TALK)	Up to about 6 hours
While not in use (Standby)	Up to about 14 days

• Battery life may be shortened depending on usage conditions, such as viewing the Caller ID Caller List or directory list, and ambient temperature.
• **Clean the handset and the base unit charge contacts with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity.** Otherwise the battery may not charge properly.
• If the battery is fully charged, you do not have to place the handset on the base unit until "Recharge battery" is displayed and/or "{ ▮]" flashes. This will maximize the battery life.
• The battery cannot be overcharged.

Standby mode

Handset (While off the base unit)

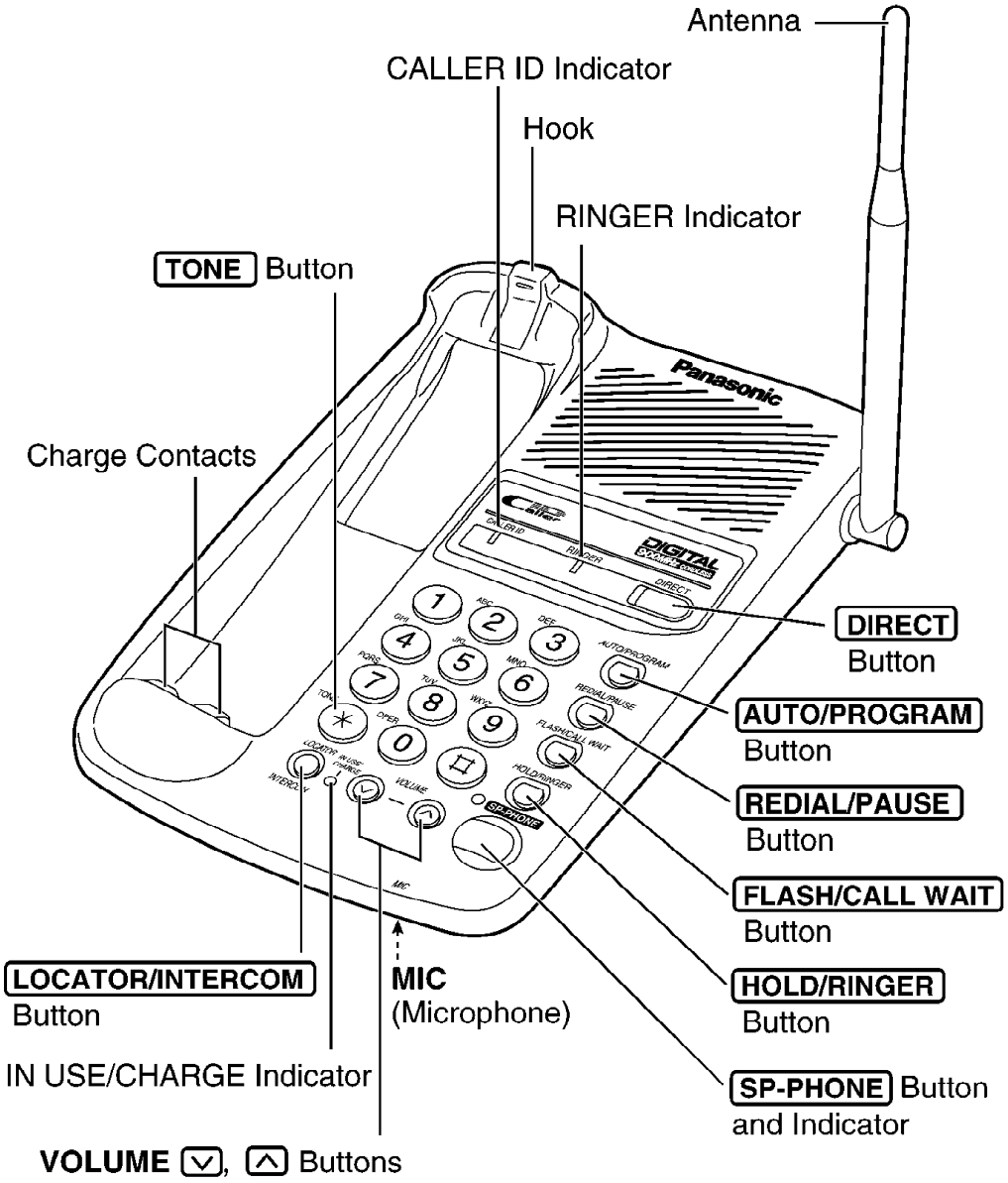
The handset goes into the standby mode after you finish using the handset (making/answering a call, viewing the Caller List or directory list etc.). The display is blank, but the handset can receive calls. The battery life is conserved in this mode.

Base Unit

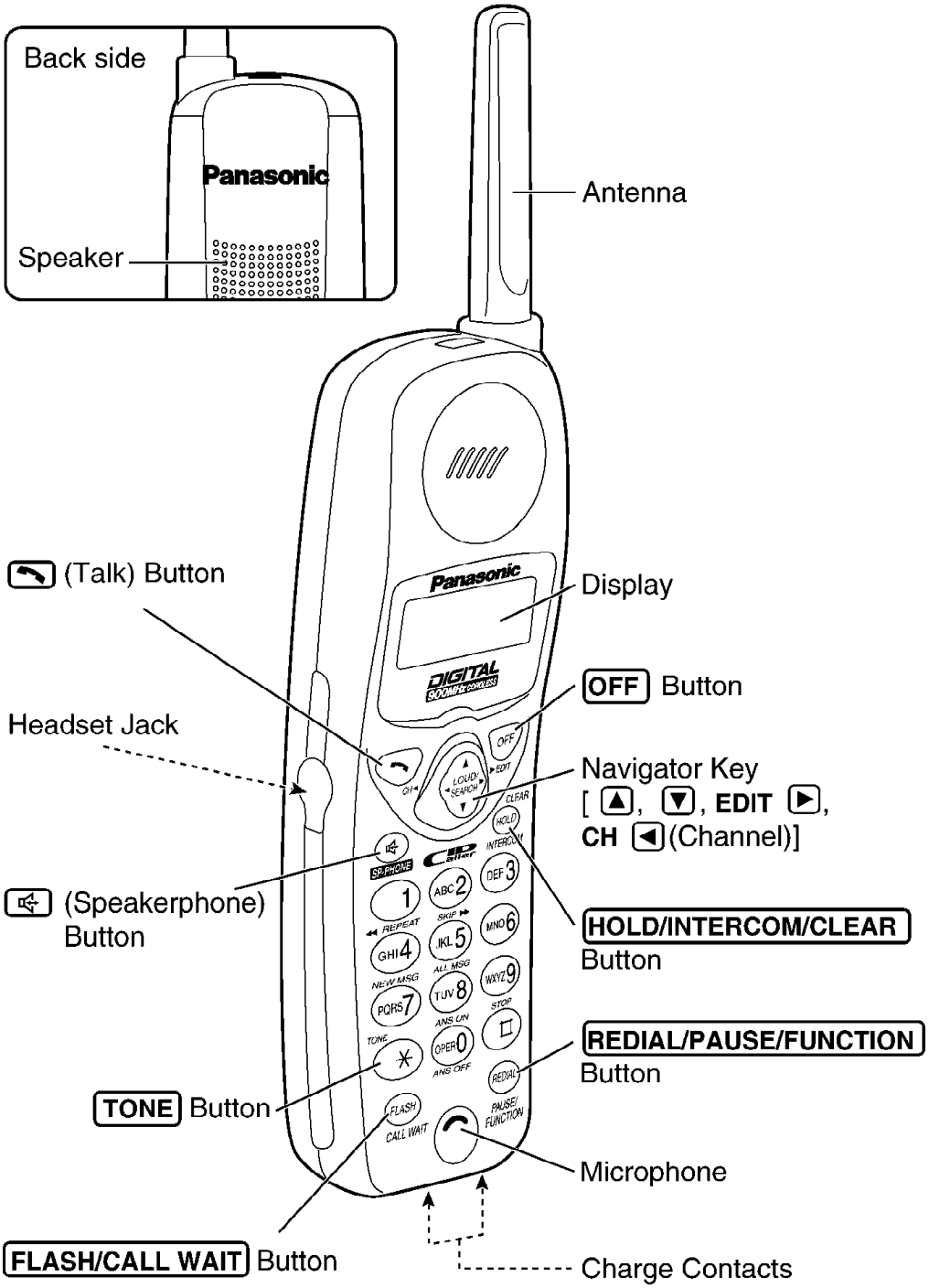
The base unit goes into the standby mode after you finish using the base unit (making/answering a call, using the intercom, using the answering system etc.). Programming and storing phone numbers are possible **only when** the base unit is in the standby mode.

2. LOCATION OF CONTROLS

2.1. Base unit

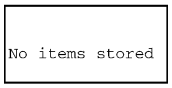

Antenna
CALLER ID Indicator
Hook
RINGER Indicator
TONE Button
Charge Contacts
DIRECT Button
AUTO/PROGRAM Button
REDIAL/PAUSE Button
FLASH/CALL WAIT Button
HOLD/RINGER Button
SP-PHONE Button and Indicator
LOCATOR/INTERCOM Button
MIC (Microphone)
IN USE/CHARGE Indicator
VOLUME ▽, △ Buttons

2.2. Handset

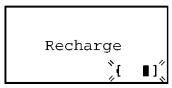


3. DISPLAY

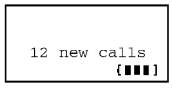
The handset shows you instructions and information on the display. These display prompts are shown below.



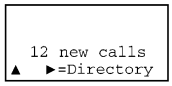
The Caller List is empty or there are no stored items in the directory.



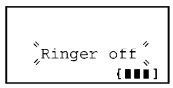
The battery needs to be charged. Place the handset on the base unit to charge the battery.



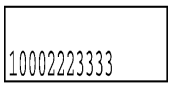
The display shows the number of new calls and the battery strength while the handset is on the base unit.



The display shows the number of new calls when ▼ or ▲ is pressed while the handset is off the base unit.
To search from the most recent call, press ▼.
To search from the oldest call, press ▲.
To go to the directory list, press **EDIT** ►
(`Directory` key).

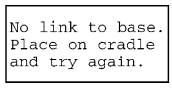


When the ringer volume is set to OFF, "`Ringer off`" will flash for about 45 seconds before the unit returns to the standby mode.

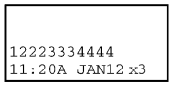


When a call is received, the display shows the caller's name and number after the first ring.

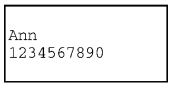
During a conversation, the display shows the length of the call (ex. 1 hour, 6 minutes and 35 seconds). The battery strength is also displayed.



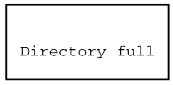
The handset has lost communication with the base unit. Place the handset on the base unit and try again.



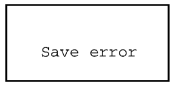
This is an information from the Caller List.
The display shows:
—the caller's name,
—the caller's number,
—the time and date of the last call
(ex. Jan. 12, 11:20 AM), and
—the number of times called (ex. 3 times).



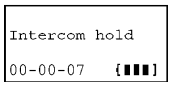
This is a name from the directory. The stored name and phone number are displayed.



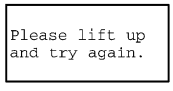
When trying to store an item or Caller List information in the directory, the directory memory is full.



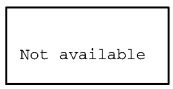
During a programming procedure, the handset has lost communication with the base unit. Move closer to the base unit.



An outside call has been put on hold by the handset in the intercom mode. To release the hold, press ↩ or ☎.

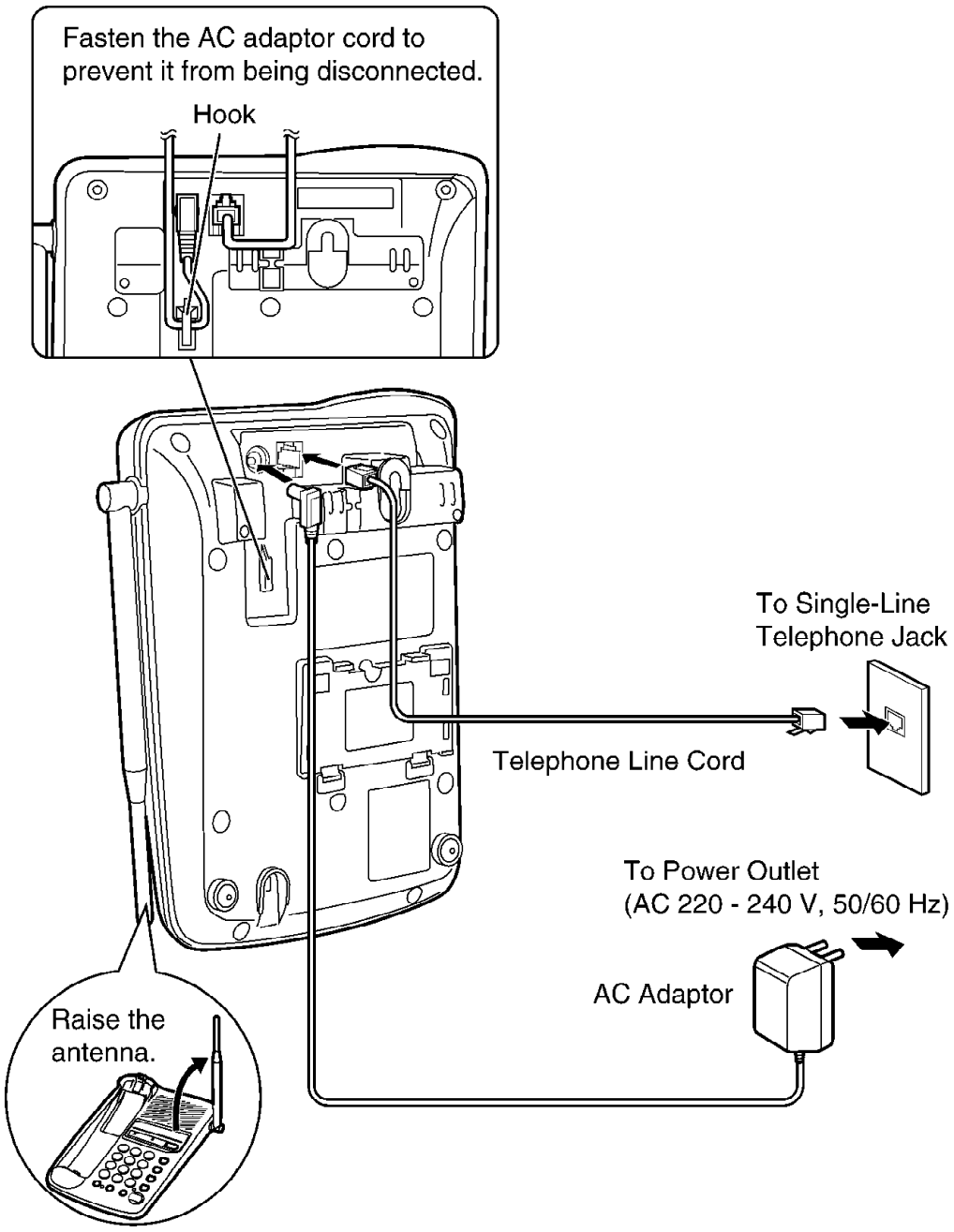


▼, ▲, **CH** ◄ or **EDIT** ► was pressed while the handset was on the base unit.
Lift the handset and press the button again.



▼, ▲, **CH** ◄ or **EDIT** ► was pressed while the base unit was not in the standby mode.

4. CONNECTIONS


Fasten the AC adaptor cord to prevent it from being disconnected.
Hook
To Single-Line Telephone Jack
Telephone Line Cord
To Power Outlet
(AC 220 - 240 V, 50/60 Hz)
AC Adaptor
Raise the antenna.

Note:

- USE ONLY WITH Panasonic AC ADAPTOR KX-TCA1BX.

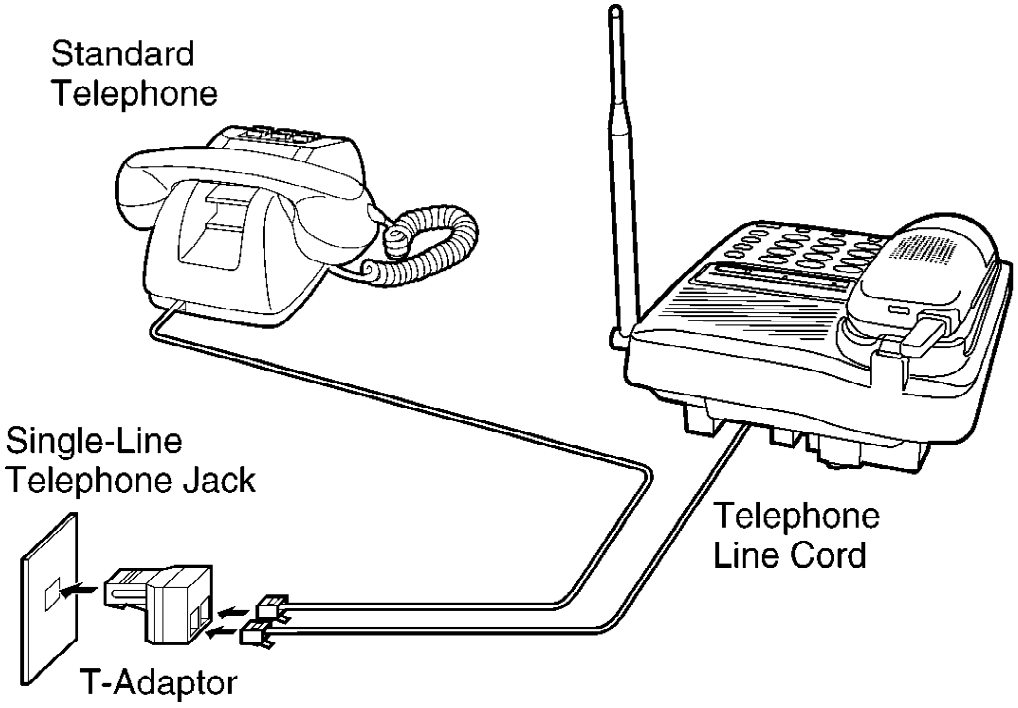
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)

- If your unit is connected to a PBX which does not support Caller ID and voice mail services, you cannot access those services.

- When more than one unit is used, the units may interfere with each other. To prevent or reduce interference, please leave ample space between the base units.

4.1. Adding Another Phone

This unit will not function during a power failure. To connect a standard telephone on the same line, use the Panasonic T-adaptor.

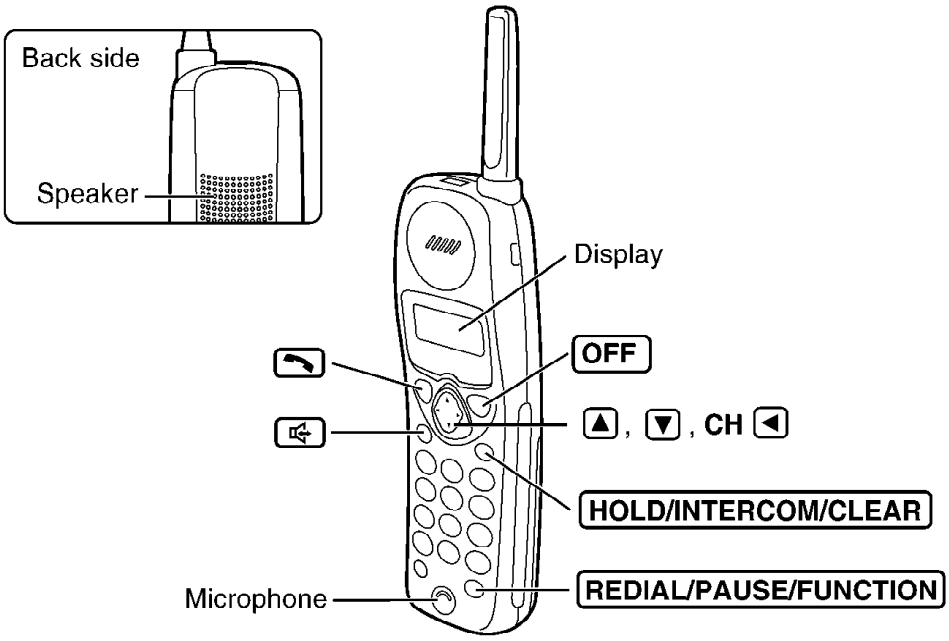


5. OPERATION

5.1. Making Calls

5.1.1. With the Handset

To have a hands-free conversation, connect an optional headset to the handset.



1 Press .

```
Talk
```

2 Dial a phone number.
- The dialed number is displayed.
- After a few seconds, the display will show the length of the call and the battery strength.

```
Talk
1112222
```

```
Talk

00-00-00   [■■■]
```

3 To hang up, press **OFF** or place the handset on the base unit.

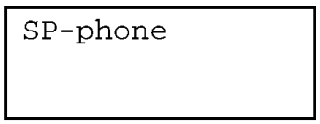
```
Off

00-01-08   [■■■]
```

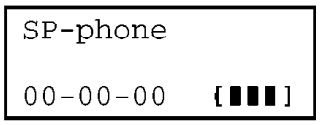
- If "No link to base Place on cradle and try again." is displayed and an alarm tone sounds in step 1, move closer to the base unit or place the handset on the base unit, and try again.

To have a hands-free phone conversation (Using Digital Duplex Speakerphone)

1 Press [SP-PHONE].

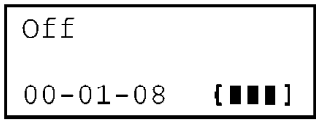


2 Dial a phone number.
- The dialed number is displayed.
- After a few seconds, the display will show the length of the call and the battery strength.



3 When the other party answers, talk into the microphone.

4 To hang up, press [OFF] or place the handset on the base unit.



- If "No link to base Place on cradle and try again." is displayed and an alarm tone sounds in step 1, move closer to the base unit or place the handset on the base unit, and try again.

Hands-free Digital Duplex Speakerphone

For best performance, please note the following:
- Talk alternately with the caller in a quiet room.
- If the other party has difficulty hearing you, press [▼] to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press [▼] to decrease the speaker volume.
- While talking using [TALK], you can switch to the hands-free phone conversation by pressing [SP-PHONE]. To switch back to the receiver, press [TALK].

If noise interferes with the conversation

Press **CH** [◄] to select a clearer channel in the talk, speakerphone, intercom or remote operation mode, or move closer to the base unit.

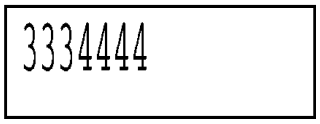
To redial the last number dialed on the handset

Press [TALK] or [SP-PHONE] ➡ [REDIAL/PAUSE/FUNCTION].

To dial after confirming the entered number

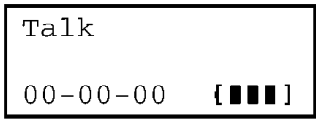
1 Dial a phone number.

- If you misdial, press **HOLD/INTERCOM/CLEAR**. One digit is erased from the right. Dial the correct phone number.



2 Press . OR
To have a hands-free phone conversation, press , and when the other party answers, talk into the microphone.

- After a few seconds, the display will show the length of the call and the battery strength.



3 To hang up, press **OFF** or place the handset on the base unit.

To adjust the receiver volume (HIGH, MEDIUM or LOW) or speaker volume (6 levels) while talking

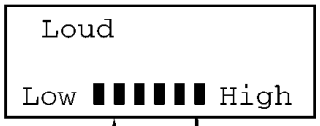
Press ▲ or ▼ while talking.

While using

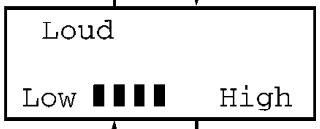
- Each time you press ▲ or ▼, the volume level will change from MEDIUM (preset) to HIGH or LOW.
- The display will return to the length of the call.

- When you replace the battery, the selected receiver volume setting will return to the factory set (MEDIUM). Reprogram if necessary.

HIGH



MEDIUM

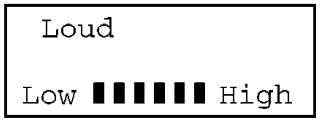


LOW

While using

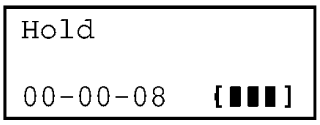
- Each time you press ▲ or ▼, the volume level will change from level 1 to 6. Your phone comes from the factory set to level 3.

Ex. Speaker volume: level 6



To put a call on hold

Press **HOLD/INTERCOM/CLEAR**.



- "Hold" is displayed.
- If you do not press any key more than 6 minutes, an alarm tone will sound.
- If you do not press any key more than 10 minutes after holding a call, a line will be disconnected.

To release the hold

From the handset, press or .
From the base unit, press **SP-PHONE**.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

Backlit LCD display

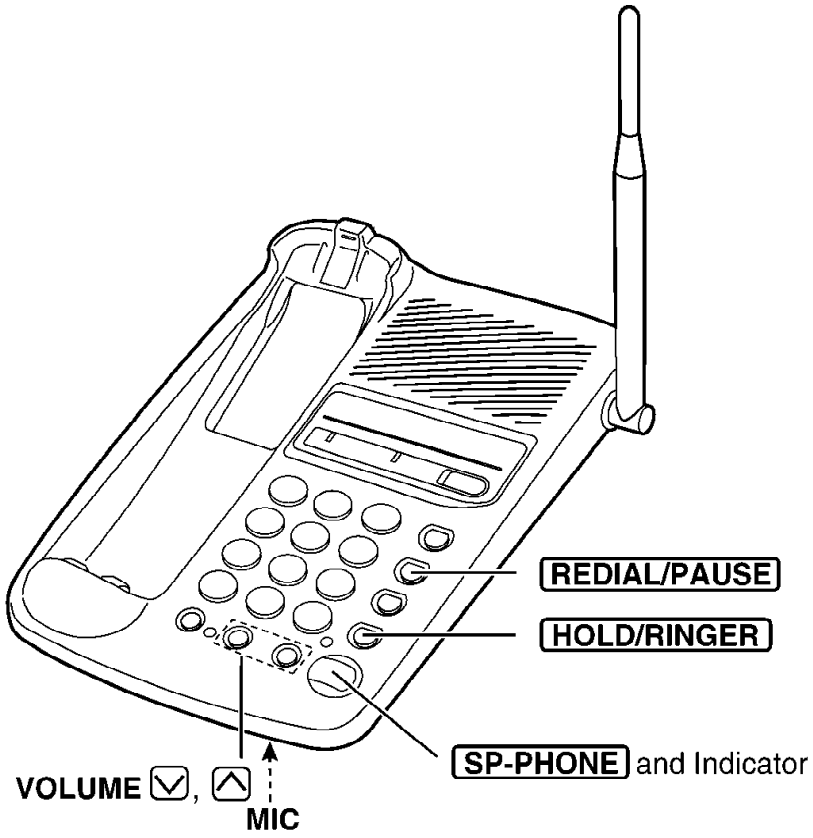
The lighted handset display will stay on for a few seconds after pressing a handset button, lifting the handset off the base unit, hanging up a call, leaving the programming mode or ending the intercom.

Lighted handset keypad

The handset dialing buttons will light when you press a button or lift the handset off the base unit, and flash when a call is received. The lights will go out a few seconds after pressing a button, lifting the handset, answering a call, hanging up a call, leaving the programming mode or ending the intercom.

5.1.2. With the Base Unit

(Digital Duplex Speakerphone)



1 Press **SP-PHONE**.
• The SP-PHONE indicator lights.

2 Dial a telephone number.

3 When the other party answers, talk into the **MIC** (microphone).

4 To hang up, press **SP-PHONE**.
• The indicator light goes out.

• To switch to the handset while using the speakerphone:
—If the handset is off the base unit, press [ ] or [ ].
—If on the base unit, just lift up.
• During a call using the handset, the call can be switched to the base unit speakerphone by pressing **SP-PHONE** on the base unit.

Hands-free Digital Duplex Speakerphone

For best performance, please note the following:
- Talk alternately with the caller in a quiet room.
- If the other party has difficulty hearing you, press **VOLUME** ▽ to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press **VOLUME** ▽ to decrease the speaker volume.

To adjust the speaker volume (8 levels) while talking

To increase, press **VOLUME** △.
To decrease, press **VOLUME** ▽.

To redial the last number dialed on the base unit

Press [SP-PHONE] ➡ [REDIAL/PAUSE].

To put a call on hold

Press [HOLD/RINGER].

- The SP-PHONE indicator flashes.

To release the hold

From the base unit, press [SP-PHONE].
From the handset, press [ ] or [ ] lift the handset off the base unit.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

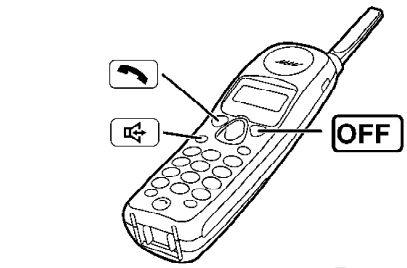
Simultaneous Keypad Dialing

You can use the base unit like a standard telephone. After pressing [ ] or [ ] to make a call with the handset near the base unit, you can also dial using the base unit keypad.

1 Handset:
Press [ ] or [ ].

2 Base unit:
Dial a telephone number while hearing a dial tone on the handset.
- When the other party answers, talk using the handset.

3 Handset:
To hang up, press [OFF] or place the handset on the base unit.



Simultaneous Keypad Dialing is only possible after pressing [ ] or [ ].

Useful information

You can enter numbers using the base unit keypad during a call with the handset. For example, to access an answering service, electronic banking service, etc.

1. Handset:
   Press [ ] or [ ].

2. Handset:
   Dial a telephone number.
   - You can also dial with base unit keypad.

3. Base unit:
   Enter the required numbers while listening to the pre-recorded instructions.

4. Handset:
   To hang up, press [OFF] or place the handset on the base unit.

5.2. Answering Calls

When a call is received, the unit rings and the RINGER indicator on the base unit flashes

quickly. If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. In order to view the Caller ID information, please wait until the second ring to answer a call.

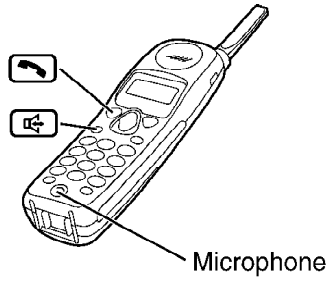
5.2.1. With the Handset

Lift the handset off the base unit;
Press [ ].

- You can also answer a call by pressing any dialing button [0] to [9], [*] or [#] (—**Any Key Talk**).

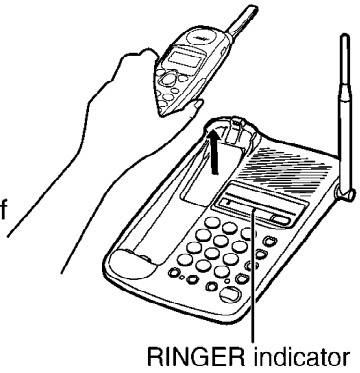
OR

Press [ ], and when the other party answers, talk into the microphone.



Auto Talk

If you set the Auto Talk feature to ON, you can answer a call by lifting the handset off the base unit without pressing [ ] or [ ].



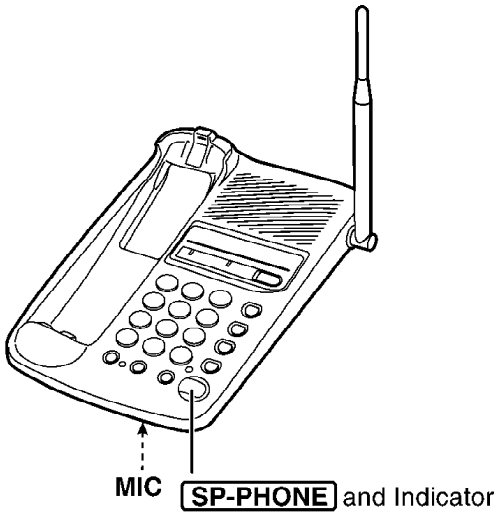
When an optional headset is connected, make sure to use the headset to talk with the caller. If you want to have a normal cordless phone conversation, disconnect the headset.

5.2.2. With the Base Unit

1 Press [SP-PHONE].
- The SP-PHONE indicator lights.

2 Talk into the **MIC**.

3 To hang up, press [SP-PHONE].
- The indicator light goes out.



5.3. FLASH Button

Pressing **FLASH/CALL WAIT** or **FLASH/CALL WAIT** allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

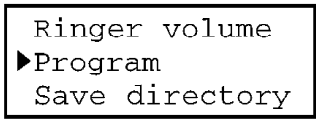
Selecting the flash time

The flash time depends on your telephone exchange or host PBX.
You can select the following flash times: "700, 600, 400, 300, 250, 110, 100 or 90 ms (milliseconds)". Your phone comes from the factory set to "700 ms".

Make sure the unit is in the standby mode.

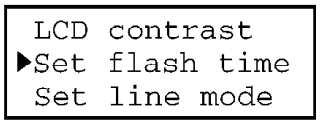
1 Press **REDIAL/PAUSE/FUNCTION**.

2 Press ▼ or ▲ repeatedly until the arrow points to "Program".

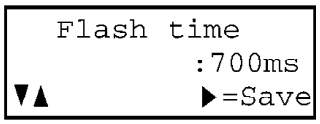


3 Press **EDIT** ▶.

4 Press ▼ or ▲ repeatedly until the arrow points to "Set flash time".

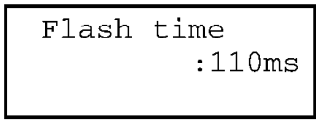


5 Press **EDIT** ▶.



6 Press ▼ or ▲ repeatedly until the desired time is displayed.

7 Press **EDIT** ▶ (Save key).
- A beep sounds.
- To return to the standby mode, press **OFF**.



- You can exit the programming mode any time by pressing **OFF**.
- If you are connected via a PBX, a longer flash time may be necessary to use PBX functions (transferring a call etc.). Consult your PBX supplier for the correct setting.

6. DISASSEMBLY INSTRUCTIONS

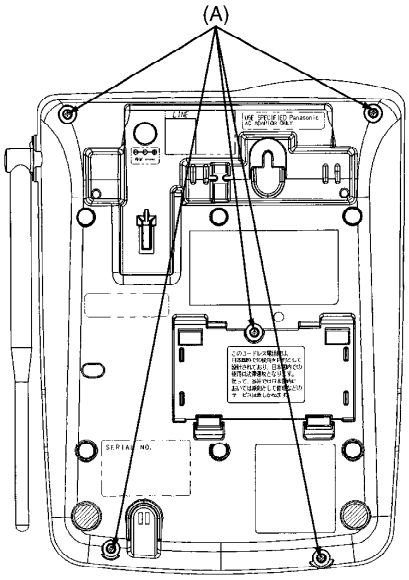
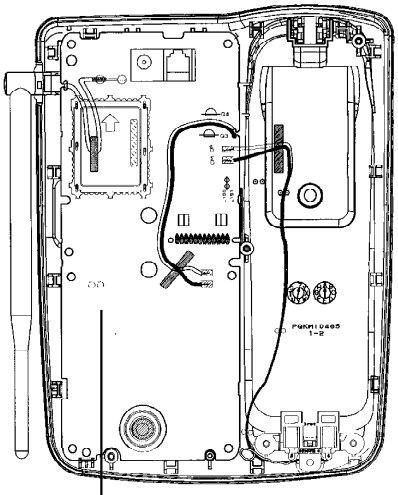
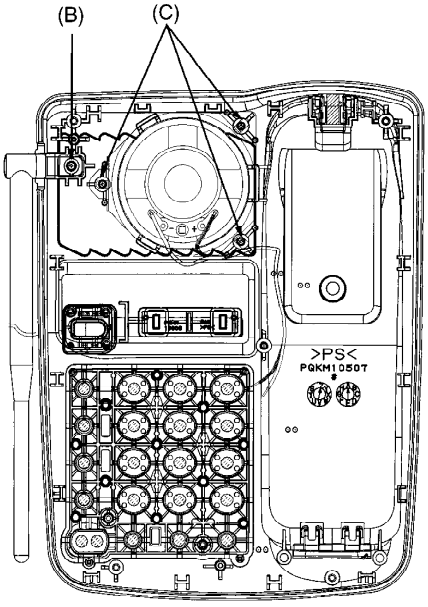


Fig. 1



Remove the
P. C. Board

Fig. 2



Flg. 3

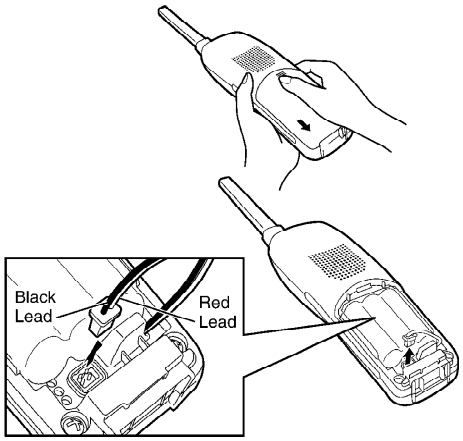


Fig. 4

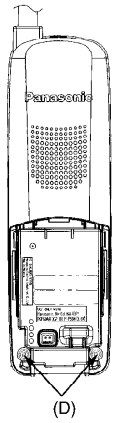


Fig. 5

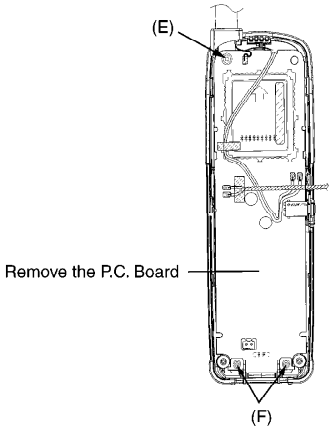


Fig. 7

Note: When opening the upper cabinet, be careful of the speaker lead wire.

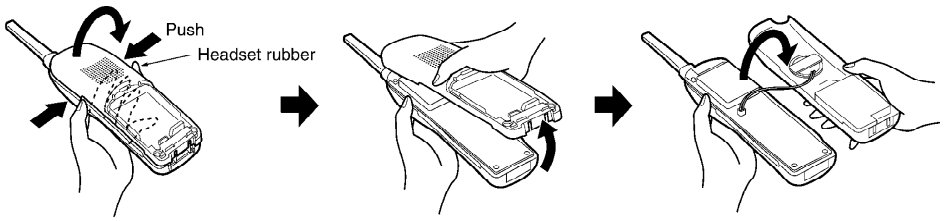
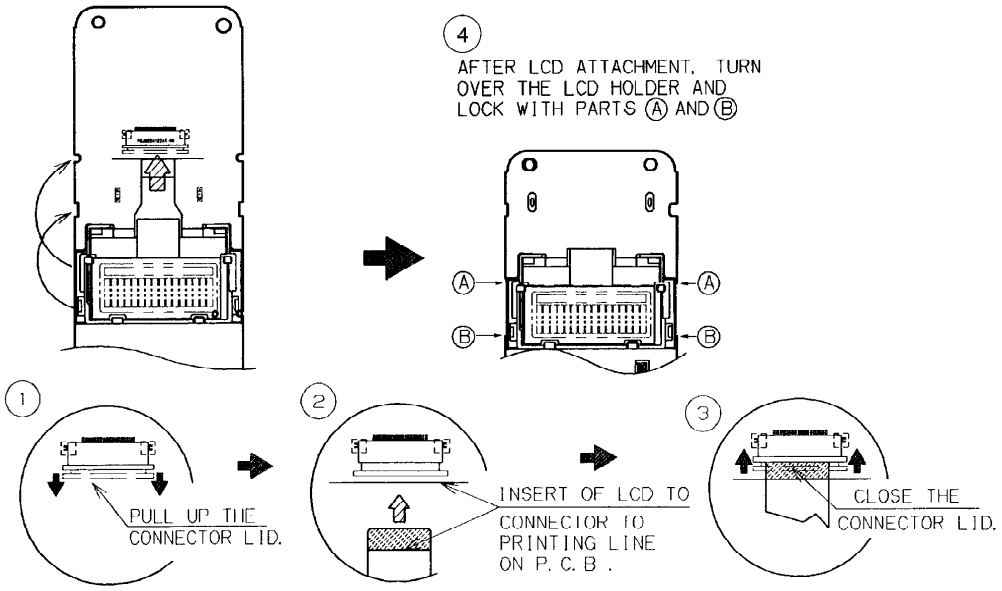


Fig. 6

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 X 12).....(A) X 5
2	Main P.C. Board	Remove the P.C. Board
3	Antenna	Screw (2.6 X 12).....(B) X 1
	Speaker	Screws (3 X 8).....(C) X 3
4	Battery Cover	Remove the Battery Cover
5	Rear Cabinet	Screws (2.6 X 12).....(D) X 2
6	Rear Cabinet	Remove the Rear Cabinet
7	Main P.C. Board	Screw (2.6 × 12).....(E) × 1
		Screws (2.6 × 10).....(F) × 2
		Remove the lead
		Remove the P.C. Board

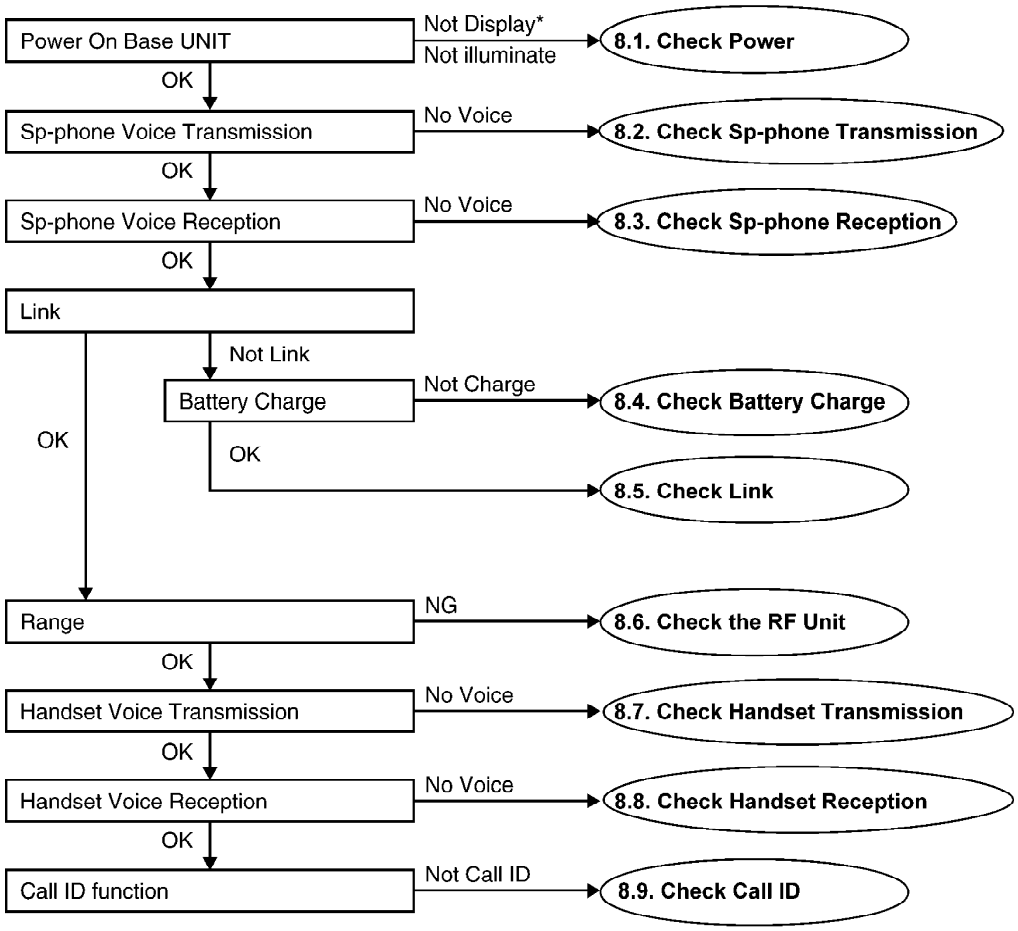
7. ASSEMBLY INSTRUCTIONS

7.1. Assembly the LCD to P.C. Board (Handset)


4
AFTER LCD ATTACHMENT, TURN OVER THE LCD HOLDER AND LOCK WITH PARTS Ⓐ AND Ⓑ
Ⓐ
Ⓑ
1
PULL UP THE CONNECTOR LID.
2
INSERT OF LCD TO CONNECTOR TO PRINTING LINE ON P.C.B.
3
CLOSE THE CONNECTOR LID.

8. TROUBLESHOOTING GUIDE

MAIN



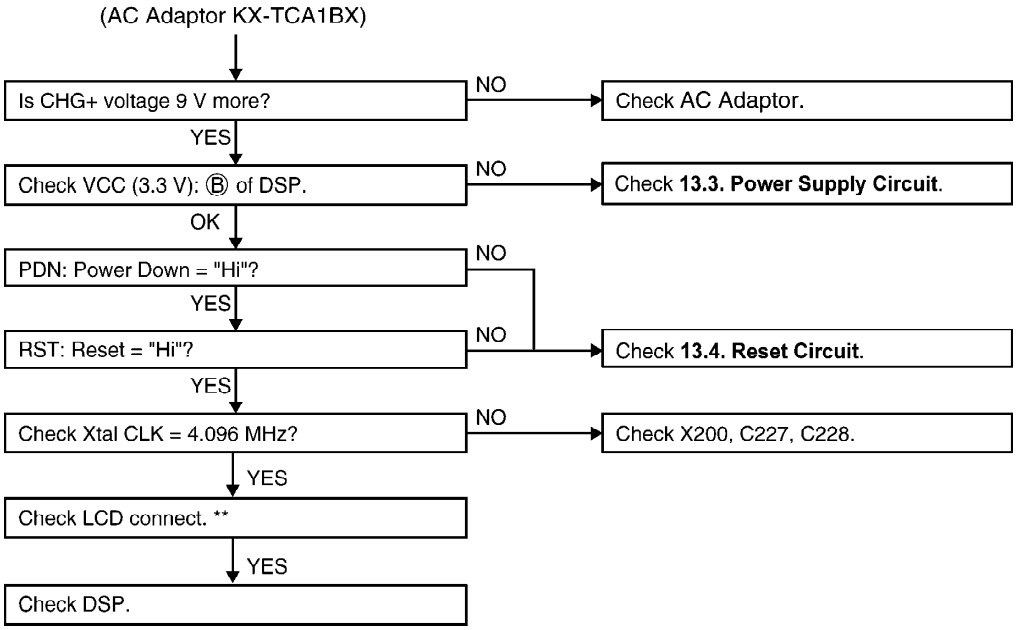
Cross Reference:

Check Power ()

Check Sp-phone Transmission ()
Check Sp-phone Reception ()
Check Battery Charge ()
Check Link ()
Check the RF Unit ()
Check Handset Transmission ()
Check Handset Reception ()
Check Call ID ()
*** Depending on models.**

8.1. Check Power

BASE UNIT
Is the AC Adaptor inserted into AC outlet?* (* Check the AC Adaptor's specification.)

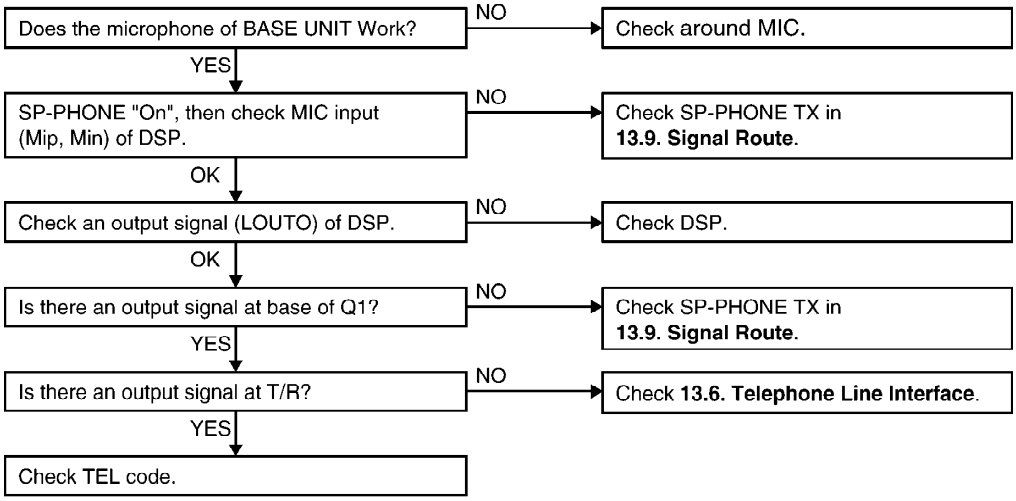


Cross Reference:
Power Supply Circuit ()
Reset Circuit ()

NOTE:
EEPROM is IC202.
DSP is IC201.
****Model with no LCD can skip.**

8.2. Check Sp-phone Transmission

BASE UNIT

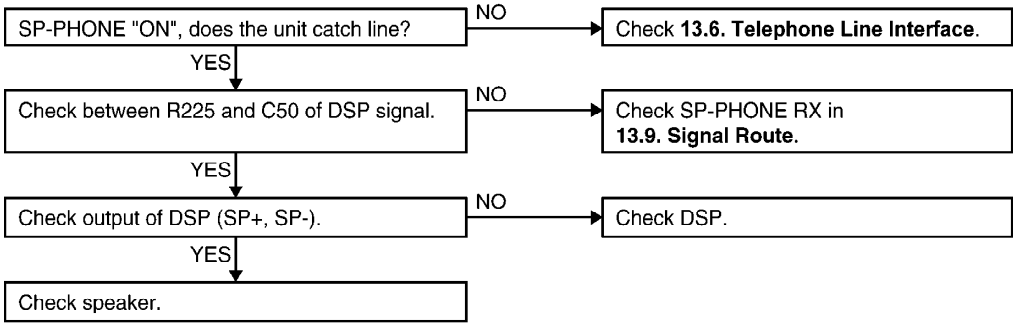


Cross Reference:
Telephone Line Interface ()
Signal Route ()

NOTE:
EEPROM is IC202.
DSP is IC201.

8.3. Check Sp-phone Reception

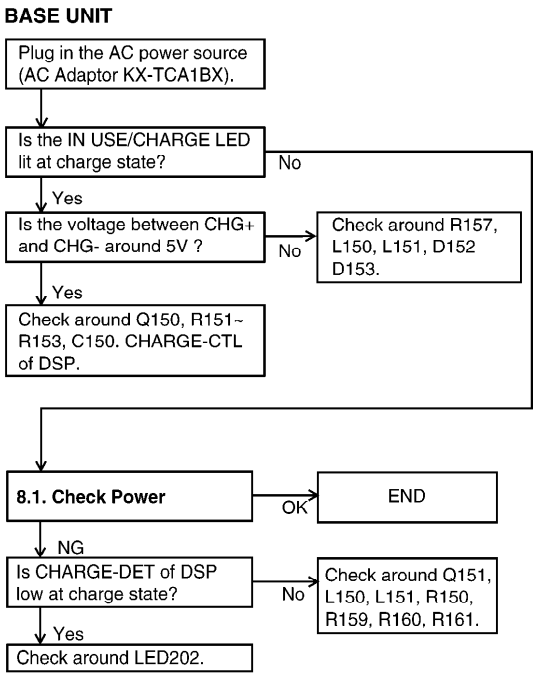
BASE UNIT



Cross Reference:
Telephone Line Interface ()
Signal Route ()

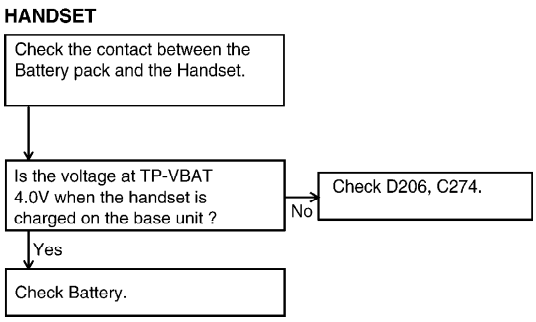
NOTE:
EEPROM is IC202.
DSP is IC201.

8.4. Check Battery Charge

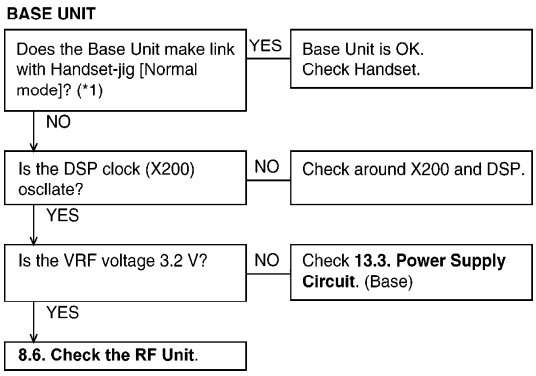

BASE UNIT
Plug in the AC power source (AC Adaptor KX-TCA1BX).
Is the IN USE/CHARGE LED lit at charge state?
No
Yes
Is the voltage between CHG+ and CHG- around 5V ?
No
Check around R157, L150, L151, D152 D153.
Yes
Check around Q150, R151~ R153, C150. CHARGE-CTL of DSP.
8.1. Check Power
OK
END
NG
Is CHARGE-DET of DSP low at charge state?
No
Check around Q151, L150, L151, R150, R159, R160, R161.
Yes
Check around LED202.

NOTE:
EEPROM is IC202.
DSP is IC201.

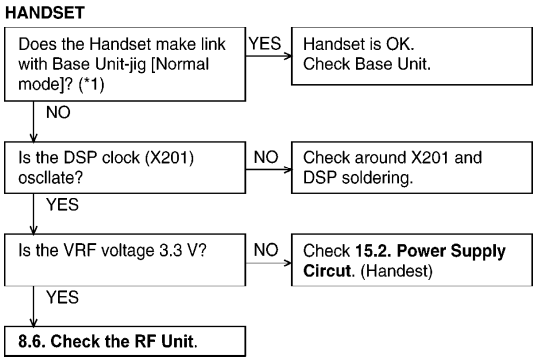
Cross Reference:
Check Power ()


HANDSET
Check the contact between the Battery pack and the Handset.
Is the voltage at TP-VBAT 4.0V when the handset is charged on the base unit ?
No
Check D206, C274.
Yes
Check Battery.

8.5. Check Link



NOTE:
EEPROM is IC202.
DSP is IC201.



(*1) Refer to Finding out the Defective Unit ().

Cross Reference:
Check the RF Unit ()
Power Supply Circuit ()
Power Supply Circuit ()

8.6. Check the RF Unit

8.6.1. Finding out the Defective Unit

Prepare HS JIG (Handset-jig) and BS JIG (Base Unit-jig) 2). Place the HS JIG on the cradle of the base unit for checking, then confirm that they are linked. Place the handset for checking on the cradle of the BS JIG, then confirm that they are linked. How to confirm the link is as follows; press the TALK button and confirm that the LEDs of the base unit is turned ON.

8.6.2. Check Items

8.6.2.1. Handset-jig (HS JIG) for Base Unit

The handset unit jig also uses two modes: TEST LOW mode and NORMAL POWER mode.
(1) NORMAL POWER mode (Stand-By). In this mode the LCD will remain blank.

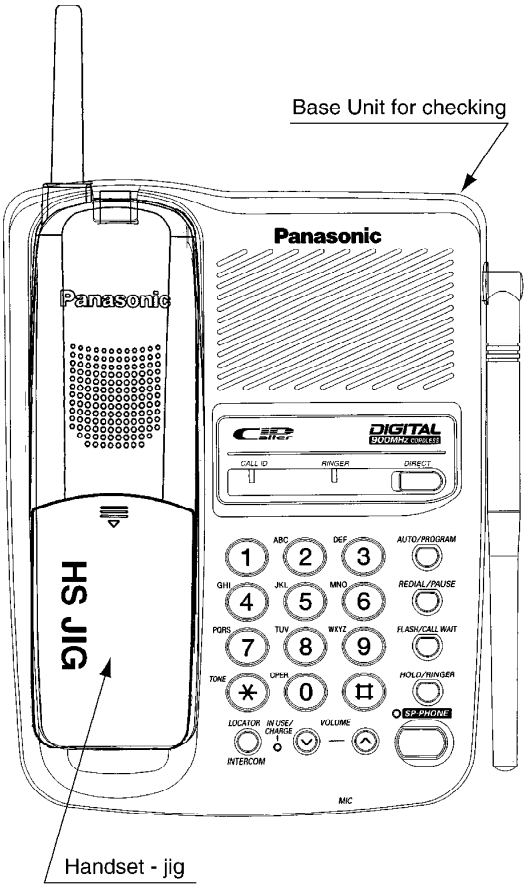
(2) TEST LOW mode. Place the portable unit on the base unit while pushing FLASH and ✳ key at the same time within 5 seconds after Power supply the portable unit. Refer to fixation

CH table, figure 1 for the ✳ key. This test simulates the handset is at very large distance from the base unit and the TX signal from handset to base is very small.
Procedure: First place handset jig on base under test to charge (exchange security code); press CLEAR and then TALK to operate. The LCD will show TALK. This means that the base unit sensitivity is OK.
*** HS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.**

NOTES:
1) If when setting the handset to TEST LOW mode, if handset beeps 3 times, the LCD shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.
2) Only KX-TC1703 with marks HS JIG/BS JIG can be used for troubleshooting. However, regular production set also can be used as a JIG.

Fixation CH	Figure 1	
CH	POWER	making key
1CH	“Lo“	"FLASH" + "1"
3CH	“Lo“	"FLASH" + "2"
5CH	“Lo“	"FLASH" + "3"
7CH	“Lo“	"FLASH" + "4"
9CH	“Lo“	"FLASH" + "5"
11CH	“Lo“	"FLASH" + "6"
13CH	“Lo“	"FLASH" + "7"
15CH	“Lo“	"FLASH" + "8"
17CH	“Lo“	"FLASH" + "9"
19CH	“Lo“	"FLASH" + "✳"
21CH	“Lo“	"FLASH" + "0"

Fig. Using TC1703 Handset-jig.

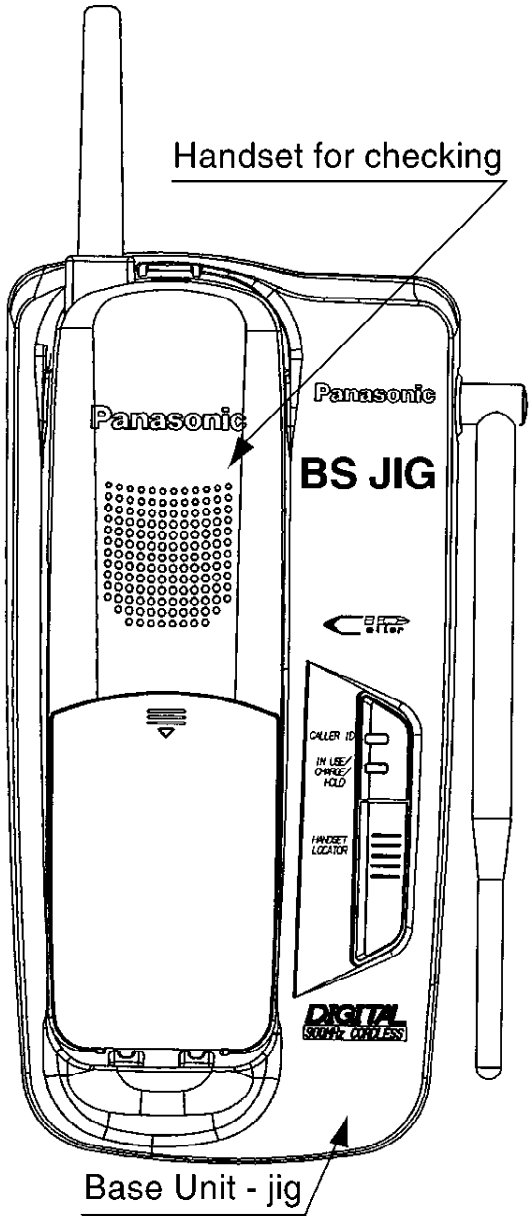


*** KX-TC1703 is used as the jig.**

8.6.2.2. Base Unit - jig (BS JIG) for Handset

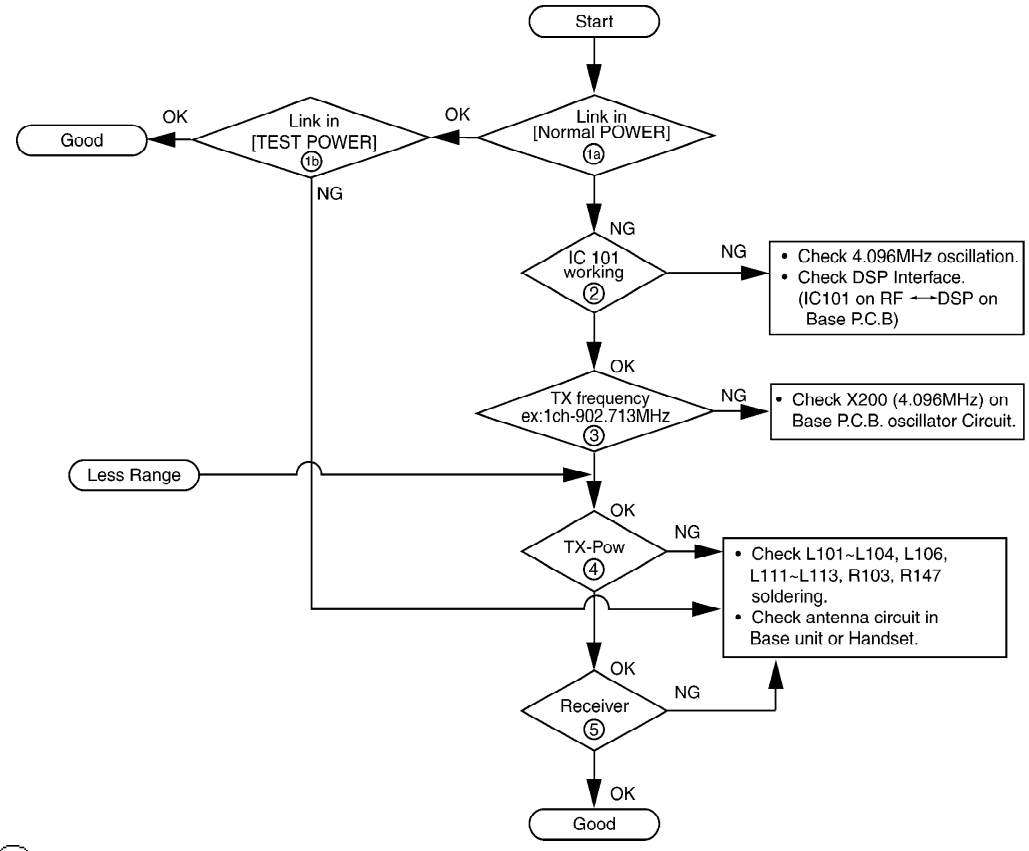
The base unit jig uses two modes: NORMAL POWER mode and TEST POWER mode.
(1) NORMAL POWER mode. This test simulates the handset is at normal/close distance. The base unit is in NORMAL POWER mode right after the AC adapter has been inserted.
(2) TEST LOW (POWER) mode. Place the portable unit on the base unit while pushing FLASH and ✳ key at the same time within 5 seconds after Power supply the portable unit. Refer to fixation CH table, figure 1 for the ✳ key. This test simulates the handset is at very large distance from the base unit and the TX signal from base to handset is very small.
Procedure: First, place handset under test to charge (exchange security code), then remove handset from base after you hear a beep. Press TALK button on handset and if it links with the base, then this handset sensitivity is OK.
*** BS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.**
NOTES:
1) If when setting the base to TEST LOW mode, if handset beeps 3 times, press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.
2) Only KX-TC1703 with marks BS JIG/HS JIG can be used for troubleshooting. However, regular production set also can be used as a JIG.

Fig. Using TC1703 Base Unit-jig.



*** KX-TC1703 is used as the jig.**

8.6.3. RF Check Flow chart



1a~5: Details of confirmation items are following in "Check Table for RF Block ()".

NOTE:
<Base Unit>
EEPROM is IC202
DSP is IC201
<Handset>
EEPROM is IC202
DSP is IC201

8.6.4. Check Table for RF Block

No	Item		BS (Base unit) (*1)	HS (Handset) (*1
1a.	Link confirmation [NORMAL POWER]	Procedure	1. Put “HS JIG” on BS. 2. Set MODE to [NORMAL POWER] position of “HS JIG“. 3. Press [TALK] key of “HS JIG” to establish link.	1. Put HS on “BS JIG”. 2. Set MODE to [NORMAL POWER] “BS JIG“. 3. Press [TALK] key of “HS” to estal
1b.	Link confirmation [TEST POWER]	Procedure	1. Change MODE to [TEST POWER] position of “HS JIG”. 2. Press [TALK] key of “HS JIG” to establish link about 30cm away from “BS”.	1. Change MODE to [TEST POWER] “BS JIG”. 2. Press [TALK] key of “HS“ to estal about 30cm away from “BS JIG”.
2	IC101 working confirmation	Procedure	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm oscillate signal (4.096 MHz at Pin 33). (*4)	1. Set Test-mode [Continuos Send L 3) 2. Confirm oscillate signal (4.096 MI (*4).
		Check point	1. Check Pin 33 oscillator. 2. Check DSP interface(IC101 ⟵ ⟶ DSP/BS) (*5).	1. Check Pin 33 oscillator. 2. Check DSP interface(IC101 ⟵ ⟶
3	TX frequency confirmation	Procedure	1. Set Test-mode [Continuos Send]. (*3) 2. Confirm TX-carrier frequency (1CH = 902.713MHz ± 20kHz).	1. Set Test-mode [Continuos Send L 3) 2. Confirm TX-carrier frequency (1C 902.713MHz ± 20kHz).
		Check point	1. Check DSP or X200 oscillator Circuit.	1. Check DSP or X201 oscillator Cir
4	TX Power confirmation	Procedure	1. Put RF wire to ANT and ANT_GND (See Base Unit Reference Drawing). Connect this wire Marconi or Spectrum Analyzer. 2. Set Test-mode. 3. Confirm TX power level within -3±5dBm (*2) (0.158~1.58mW)	1. Put RF wire to ANT and ANT_GNI Handset Reference Drawing). 2. Set Test-mode. 3. Confirm TX power level within -3 (0.158~1.58mW)
		Check point	1. Check C102~C103, C161, L102, L111, R147 soldering. 2. Check Antenna in BS.	1. Check C102~C103, C161, L102, L soldering. 2. Check Antenna in HS.
5	Receiver confirmation	Procedure	1. Put “HS JIG” on BS. 2. Set MODE to [NORMAL POWER] position of “HS JIG”. 3. Press [TALK] key of “HS JIG“ to establish link. 4. Change MODE to [TEST POWER] position of “HS JIG“. 5. Press [TALK] key of “HS JIG” to establish link about 30cm away from “BS”.	1. Put HS on “BS JIG”. 2. Set MODE to [NORMAL POWER] “BS JIG”. 3. Press [TALK] key of “HS” to estal 4. Change MODE to [TEST POWER] “BS JIG”. 5. Press [TALK] key of “HS” to estal about 30cm away from “BS JIG“.
		Check point	1. Check L103, L104, L106, L111~L113, X101, C103~C106, C110, C118, R103 soldering. 2. Check Antenna in BS.	1. Check L103, L104, L106, L111~L1 C103~C106, C110, C118, R103 solde 2. Check Antenna in HS.

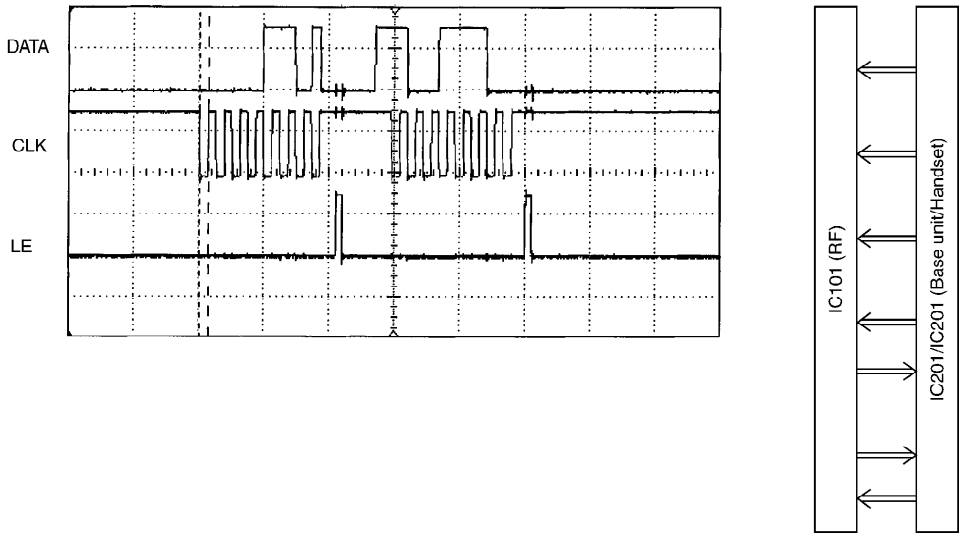
(*1) BS: Base unit, HS: Handset unit, HS JIG: Handset-jig, BS JIG: Base unit-jig
(*2)<Marconi setting>
TX Freq.; 902.713MHz mode; WB
<Spectrum analyzer setting>
Freq. 902.713MHz Span 10MHz
RBW 1MHz or above VBW same as RBW

(*3)See TEST MODE ( ).
(*4)See RF-DSP interface signal wave form ().
(*5)See Base Unit Reference Drawing ().
See Handset Reference Drawing ()

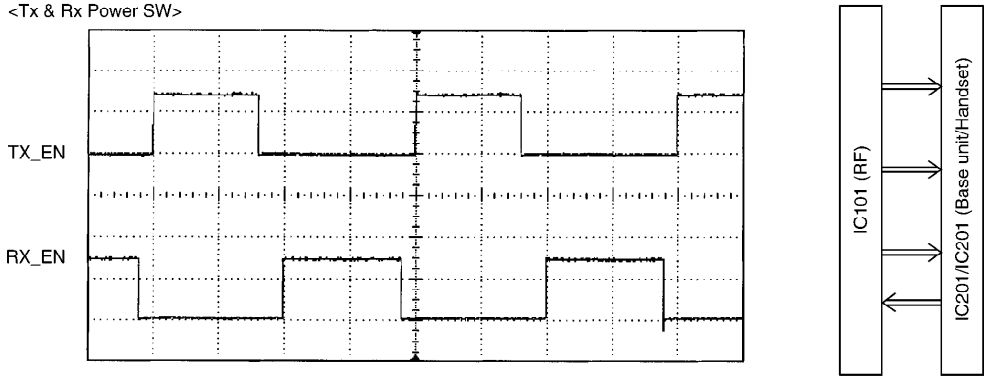
NOTE:
EEPROM is IC202 .
DSP is IC201.

8.6.5. RF-DSP interface signal wave form

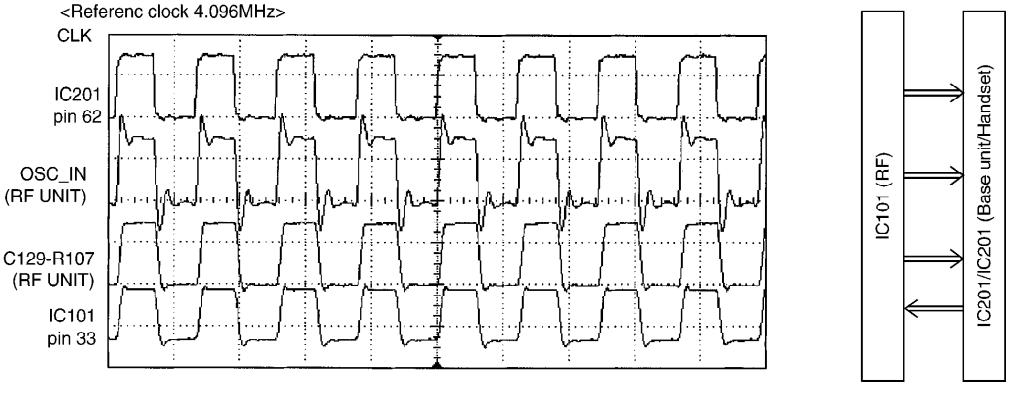
(1) Serial control line
<Standby mode>



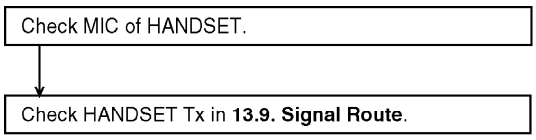
(2) Control line <Talk mode>
<Tx & Rx Power SW>



<Referenc clock 4.096MHz>

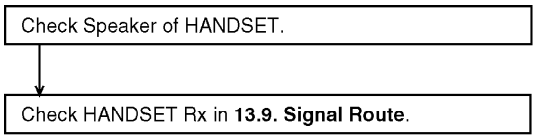


8.7. Check Handset Transmission



Cross Reference:
Signal Route ().

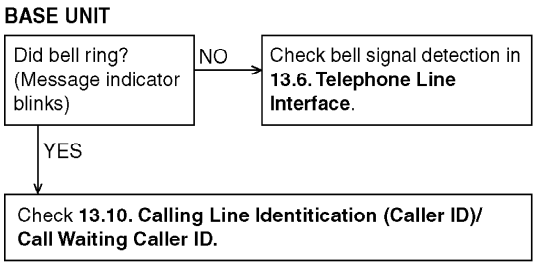
8.8. Check Handset Reception



Cross Reference:
Signal Route ().

NOTE:
When checking the RF UNIT, Refer to Check the RF Unit ()

8.9. Check Call ID

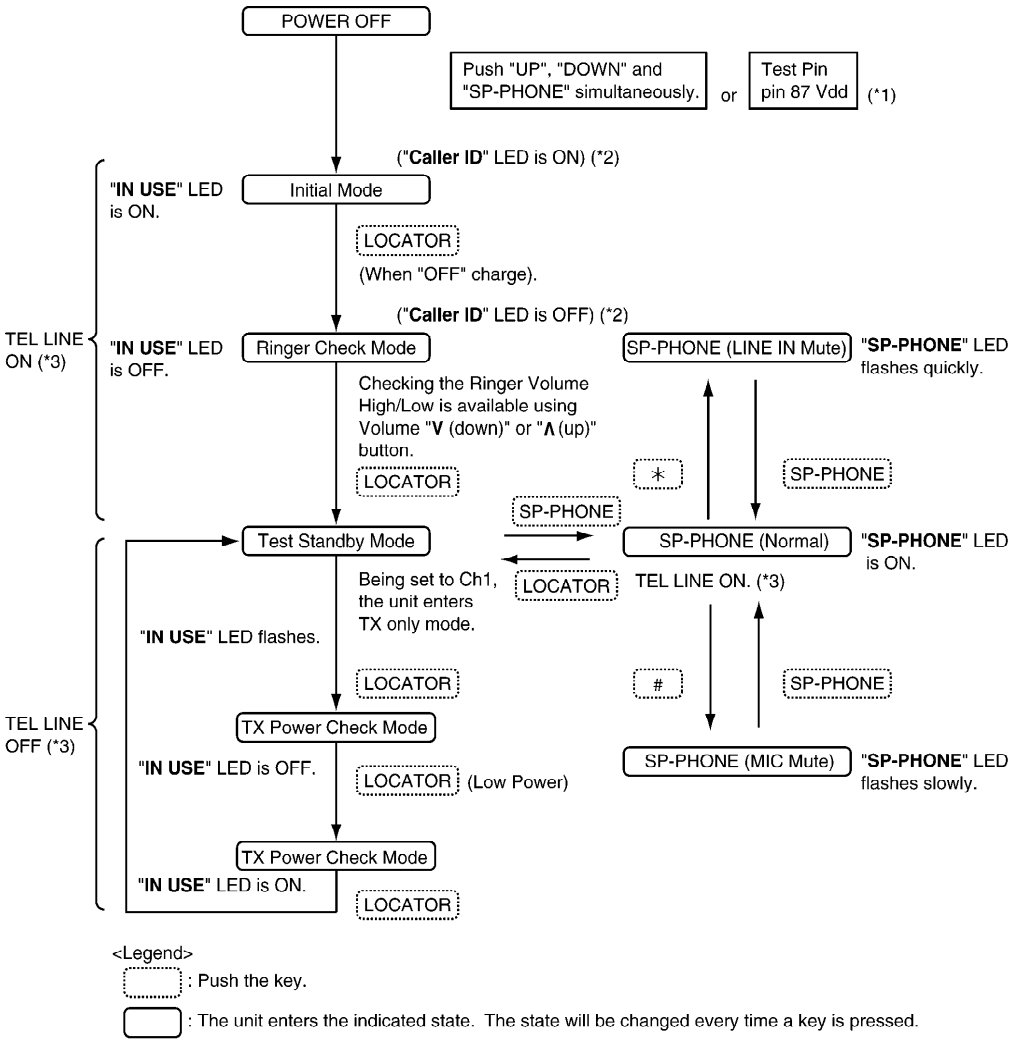

BASE UNIT
Did bell ring? (Message indicator blinks)
NO
Check bell signal detection in **13.6. Telephone Line Interface**.
YES
Check **13.10. Calling Line Identitication (Caller ID)/ Call Waiting Caller ID.**

Cross Reference:
Telephone Line Interface ().
Calling Line Identification Circuit (Caller ID) ().

Note:
- Make sure the format of the Caller ID or Call Waiting Caller ID service of the Telephone company that the customer subscribed to.
- Also we recommend to confirm that the customer is really a subscriber of the service.

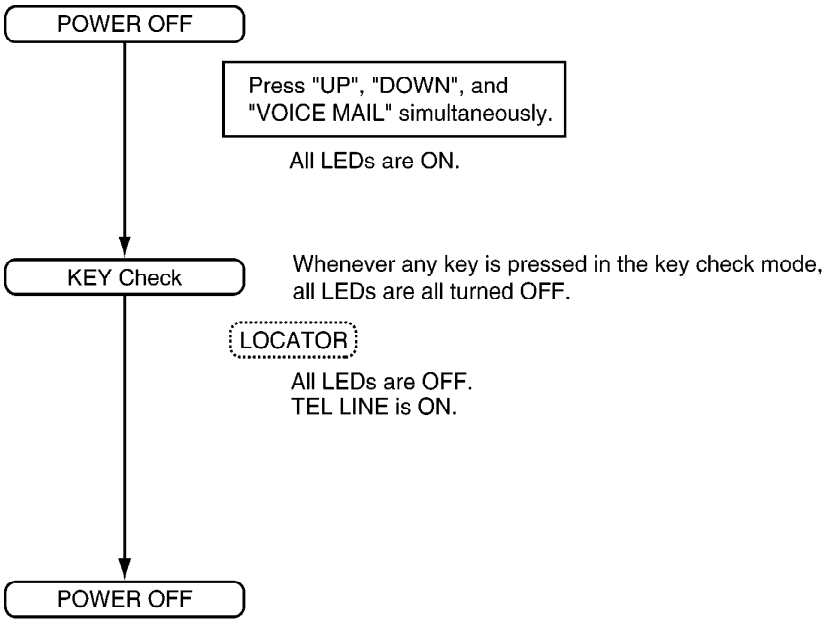
9. TEST MODE

9.1. Test mode flow chart for Base Unit



(*1) See Base Unit Reference Drawing () - Should return to OPEN after entering the Test mode.
(*2) While the Tele line is connected, the "Caller ID" LED is ON/OFF as well.
(*3) It shows whether the telephone line is connected or not.
-ON: OFF HOOK.
-OFF: ON HOOK

9.2. TAM Test mode flow chart

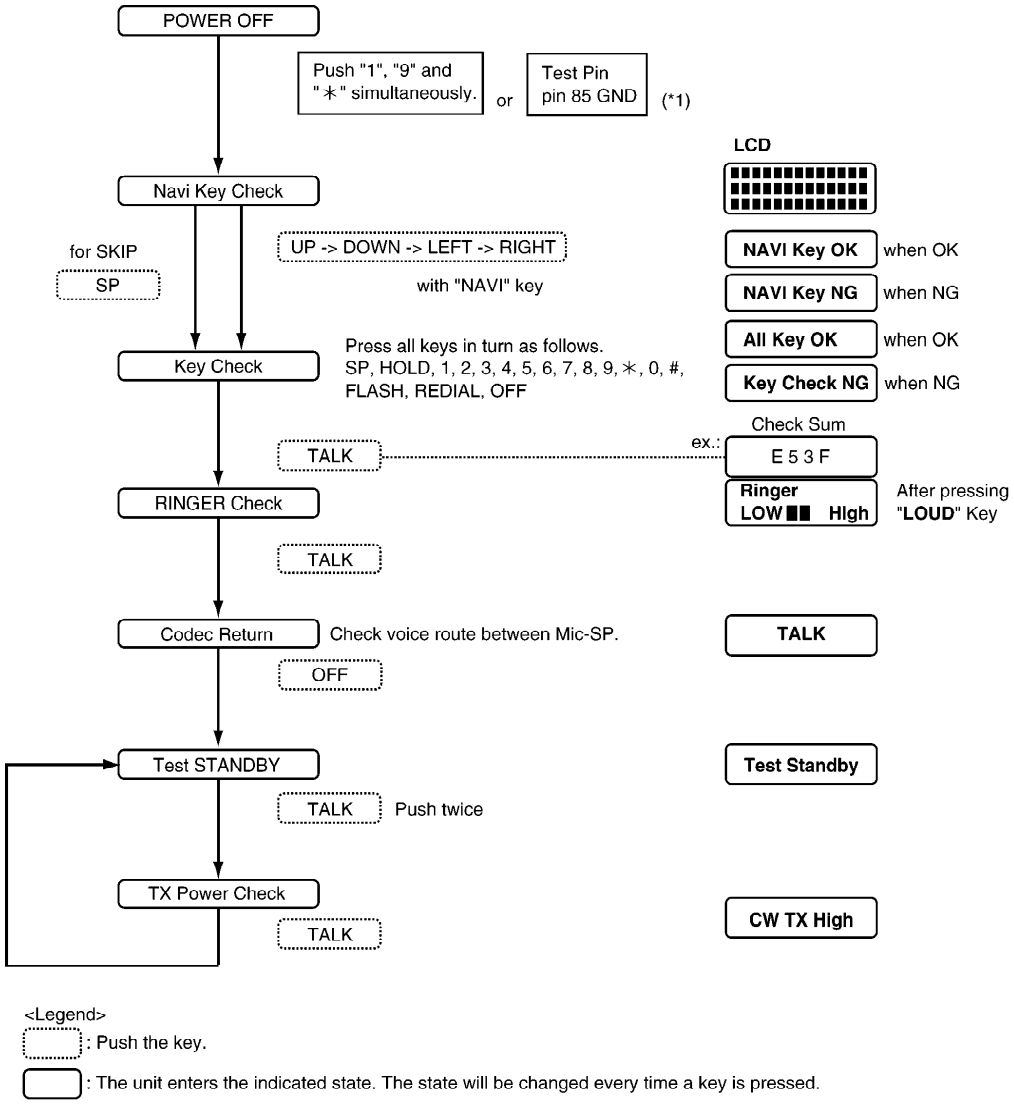


<Legend>

: Push the key.

: The unit enters the indicated state. The state will be changed every time a key is pressed.

9.3. Test mode flow chart for Handset



(*1) See Handset Reference Drawing ( ).---Should return to OPEN after entering the Test mode.

9.4. X101 Check

The confirmation is made under the Continuous Send mode of TEST MODE.
Equipment: Frequency counter
TP for adjustment: TP_ANT
Measure range: 902.713 MHz ± 5 kHz (1ch) at Test Standby mode in TEST MODE ().

9.5. Base Unit Reference Drawing

9.6. Handset Reference Drawing

9.7. FREQUENCY TABLE

(TDD: time division duplex)

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	902.713	12	925.013
2	902.940	13	925.241
3	903.168	14	925.468
4	903.395	15	925.696
5	903.623	16	925.923
6	903.850	17	926.151
7	904.078	18	926.378
8	904.305	19	926.606
9	904.533	20	926.833
10	904.761	21	927.061
11	904.988	22	927.289

10. DESCRIPTION

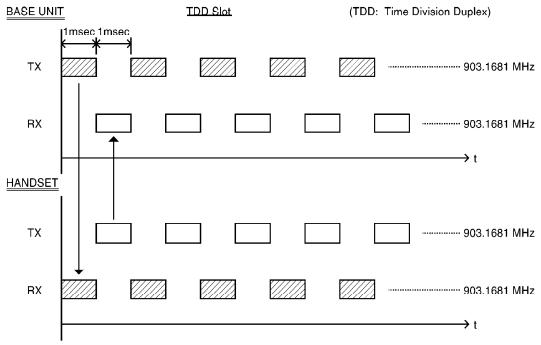
10.1. Frequency

The frequency range of 902.713 MHz ~ 927.289 MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to the Frequency Table.

10.2. Time Division Duplex (TDD) operation

Transmission/reception between the base unit and handset is performed by time-sharing as shown in Fig. 7. 1 slot time of transmission and reception is 1mS. Same frequency is used in transmitting and receiving. The figure shows an example; the frequency of 3ch is used in transmitting between the base unit and handset.

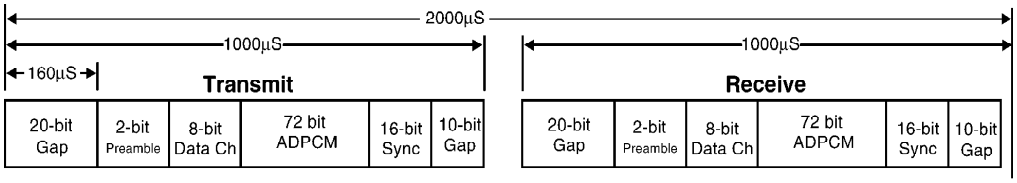
Fig. 7



10.2.1. TDD Frame Format

The TDD frame is 2mS in length. Each subframe contains 128 bits of 7.8 μ S duration. Each subframe consists of the following four fields:

- A 2-bit Preamble field
- An 8-bit Data Channel field
- An 16-bit Sync Word
- A 72-bit ADPCM Payload (CRC 8-bit)



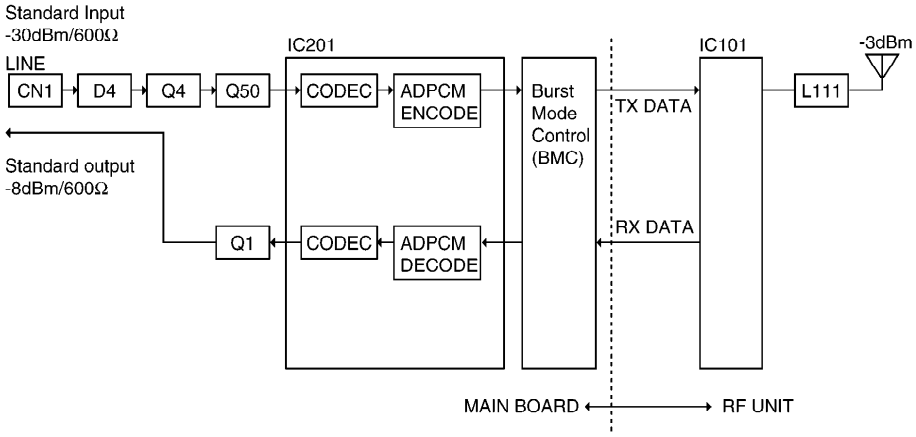
10.3. Signal Flow chart in the Whole System

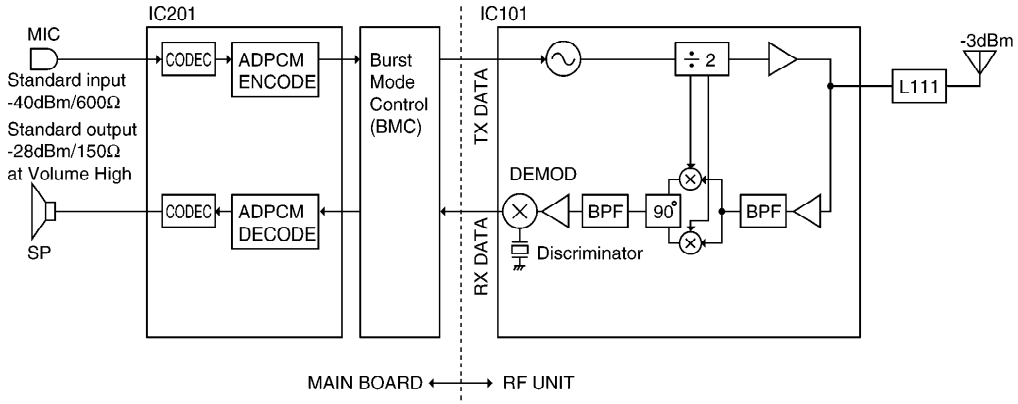
Reception

CN1 of the base unit is connected to the TEL line, and the signal is input through the bridge diode D4. While talking the relay (Q4) is turned ON and amplified at the amplifiers Q50, then led to DSP (IC201). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT. RFIC outputs FSK modulated RF signal. The RF signal is passed through filter (L111) to be transmitted from the antenna. As for the handset, RF signal from the antenna is input to RFIC passing through filter (L111) then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal, then it is output to the speaker.

Transmission

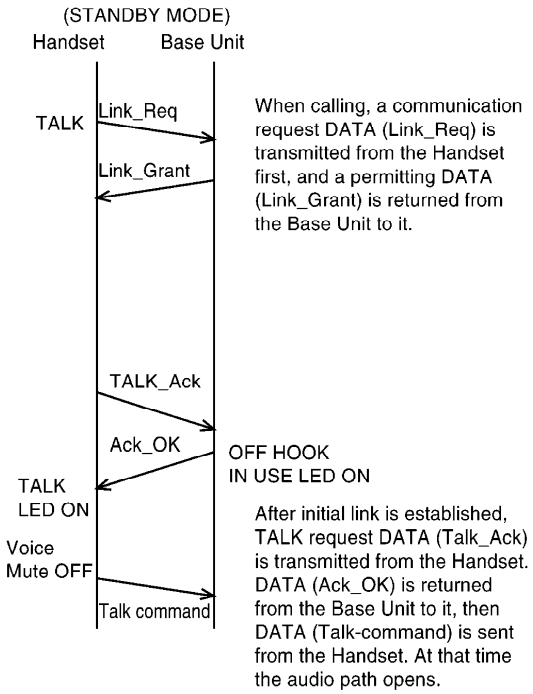
The voice signal input from the microphone is led to DSP (IC201). The DSP generates ADPCM signal. As well as the reception, it is converted into the RF signal by RFIC (IC101). Passing through filter (L111), it is transmitted from the antenna. As for the base unit, RF signal from the antenna is input to RFIC (IC101) passing through filter (L111) and the balum then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal. The voice signal is amplified at the TX amplifier (Q1), then output to the TEL line (CN1) through the relay (Q4) and bridge (D4).



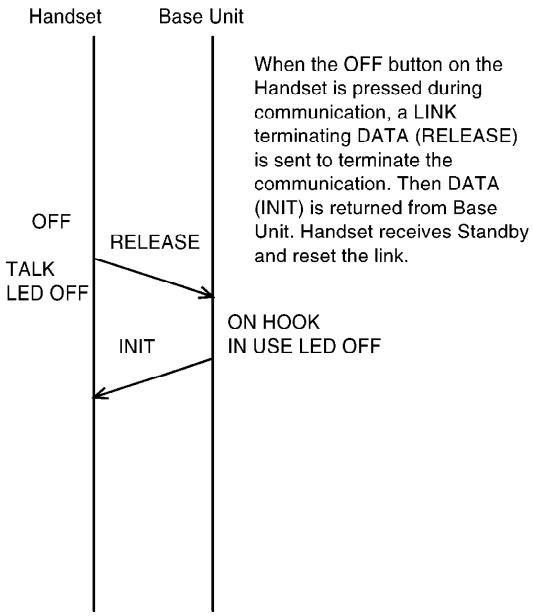


11. EXPLANATION OF BBIC (Base Band IC) DATA COMMUNICATION

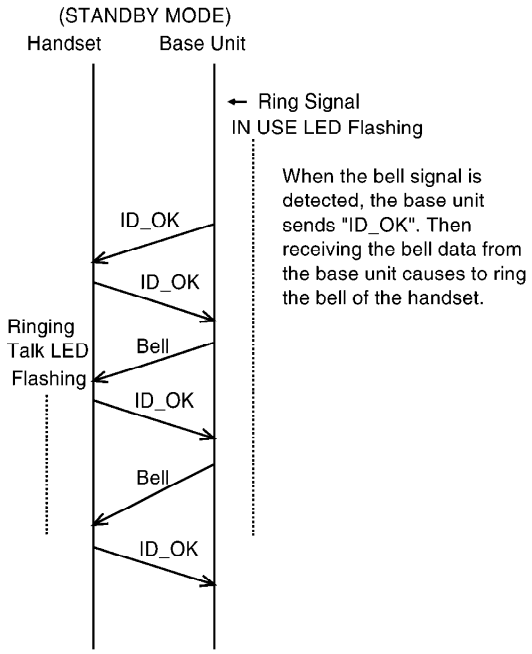
11.1. Calling


(STANDBY MODE)
Handset
Base Unit
TALK
Link_Req
Link_Grant
When calling, a communication request DATA (Link_Req) is transmitted from the Handset first, and a permitting DATA (Link_Grant) is returned from the Base Unit to it.
TALK_Ack
Ack_OK
OFF HOOK
IN USE LED ON
TALK
LED ON
Voice
Mute OFF
Talk command
After initial link is established, TALK request DATA (Talk_Ack) is transmitted from the Handset. DATA (Ack_OK) is returned from the Base Unit to it, then DATA (Talk-command) is sent from the Handset. At that time the audio path opens.

11.2. To Terminate Communication


Handset
Base Unit
When the OFF button on the Handset is pressed during communication, a LINK terminating DATA (RELEASE) is sent to terminate the communication. Then DATA (INIT) is returned from Base Unit. Handset receives Standby and reset the link.
OFF
RELEASE
TALK
LED OFF
ON HOOK
IN USE LED OFF
INIT

11.3. Ringing

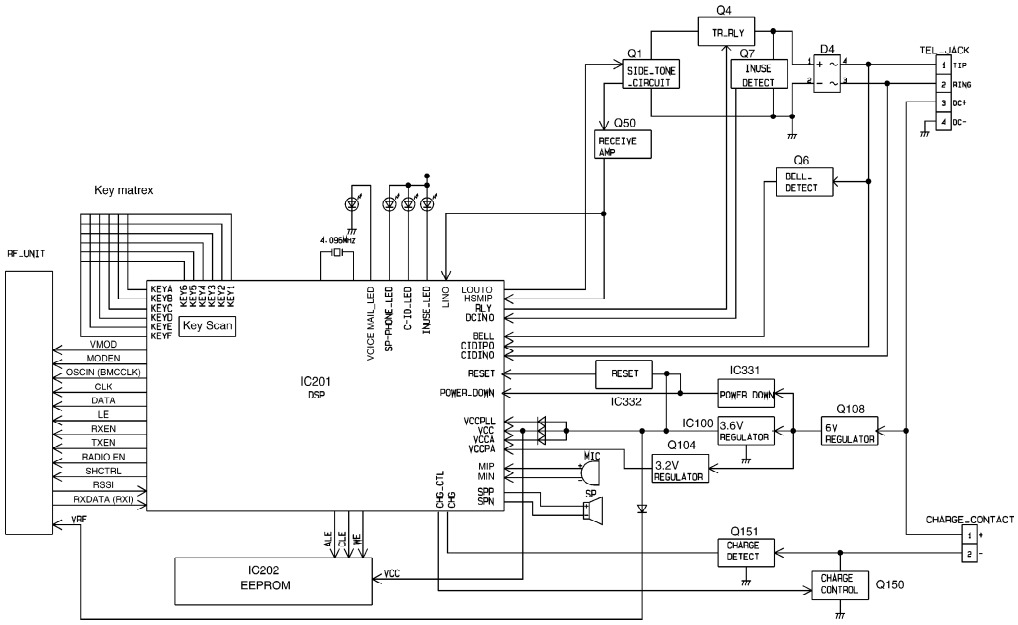


11.4. Ports for Transmitting and Receiving of Data

Handset: (IC201)
Transmitting ..... Pin 57 (TXO), Pin 64 (TXEN)
Receiving ..... Pin 66 (RXI), Pin 63 (RXEN)

Base Unit: (IC201)
Transmitting ..... Pin 57 (TXO), Pin 64 (TXEN)
Receiving ..... Pin 66 (RXI), Pin 63 (RXEN)

12. BLOCK DIAGRAM (Base Unit)



13. CIRCUIT OPERATION (Base Unit)

General Description:

(DSP, EEPROM) is a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.
The DSP system is fully controlled by a host processor DSP. The host processor provides activation and control of all that functions as follows.

13.1. DSP (Digital Speech/Signal Processing: IC201)

- DTMF Detection/Generator

The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation.
When the DTMF data from the Handset is received, the DTMF signal is output.

- Synthesized Voice (Pre-recorded message)

The DSP implements synthesized Voice, utilizing the built in speech detector and an EEPROM.

- Caller ID and Call Waiting CID demodulation

The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

- Analog Switching

The voice signal from telephone line is transmitted to the speaker or the voice signal from speakerphone microphone is transmitted to the Telephone line, etc. They are determined by the signal path route operation of voice signal.

- Block Interface Circuit

RF unit, LED, Key scan, Speaker, Microphone, Telephone line, LCD

13.2. EEPROM (IC202)

Following information data is stored.

- Telephone number, etc.

ex: Telephone Directory number, Caller ID data, ID code

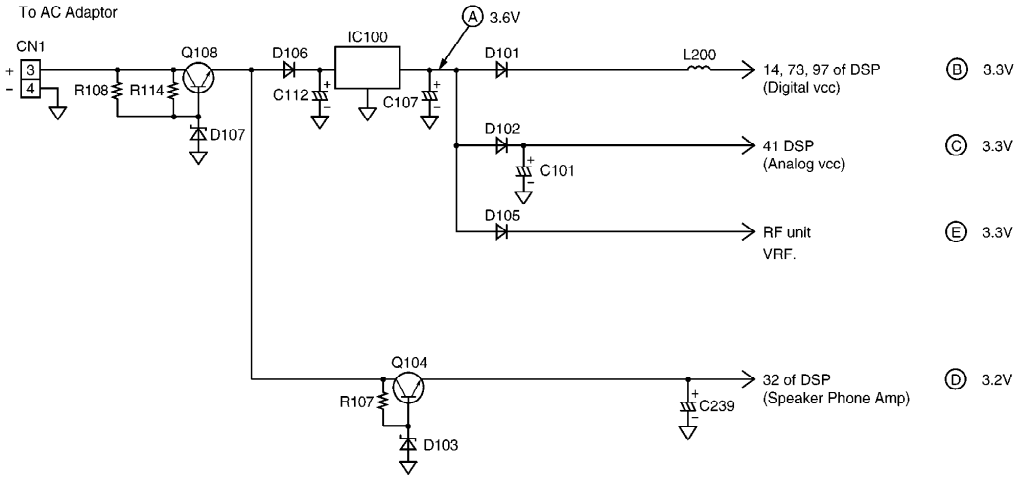
- Settings

ex: message numbers, caller ID numbers, pulse tone dial

13.3. Power Supply Circuit

Function:
The power supply voltage from AC adaptor is converted to the desired voltage of each block.
Circuit Operation:
This unit supplies the voltage to each block as shown below.

Circuit Diagram



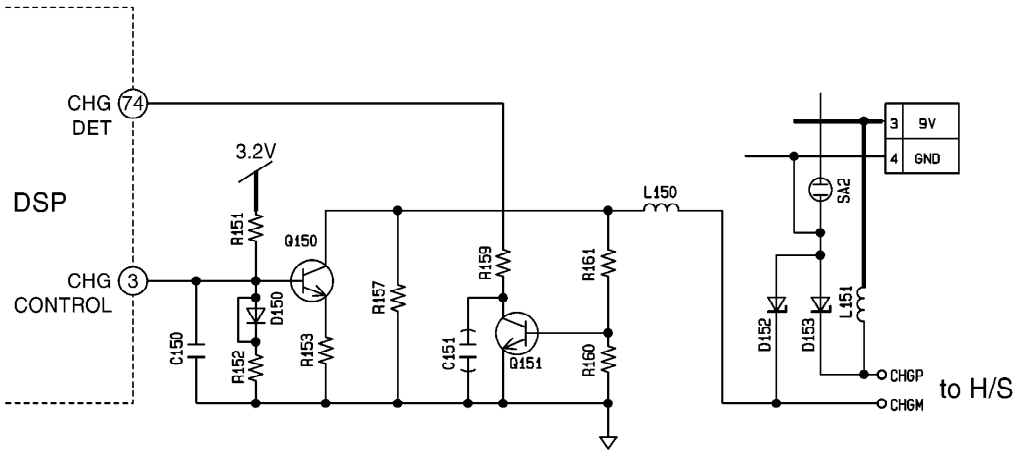
13.3.1. Charge Circuit

The voltage from the AC is supplied to the main charge circuits. Normal charge (70 mA) of maximum 20-hours is started soon after the Handset is placed on the base unit. Then it changes to trickle charge (15 mA on the average) to prevent from overcharging.

Normal charge : Q150 is ON

Trickle charge : Q150 is OFF

Circuit Diagram



13.4. Reset Circuit

Function:

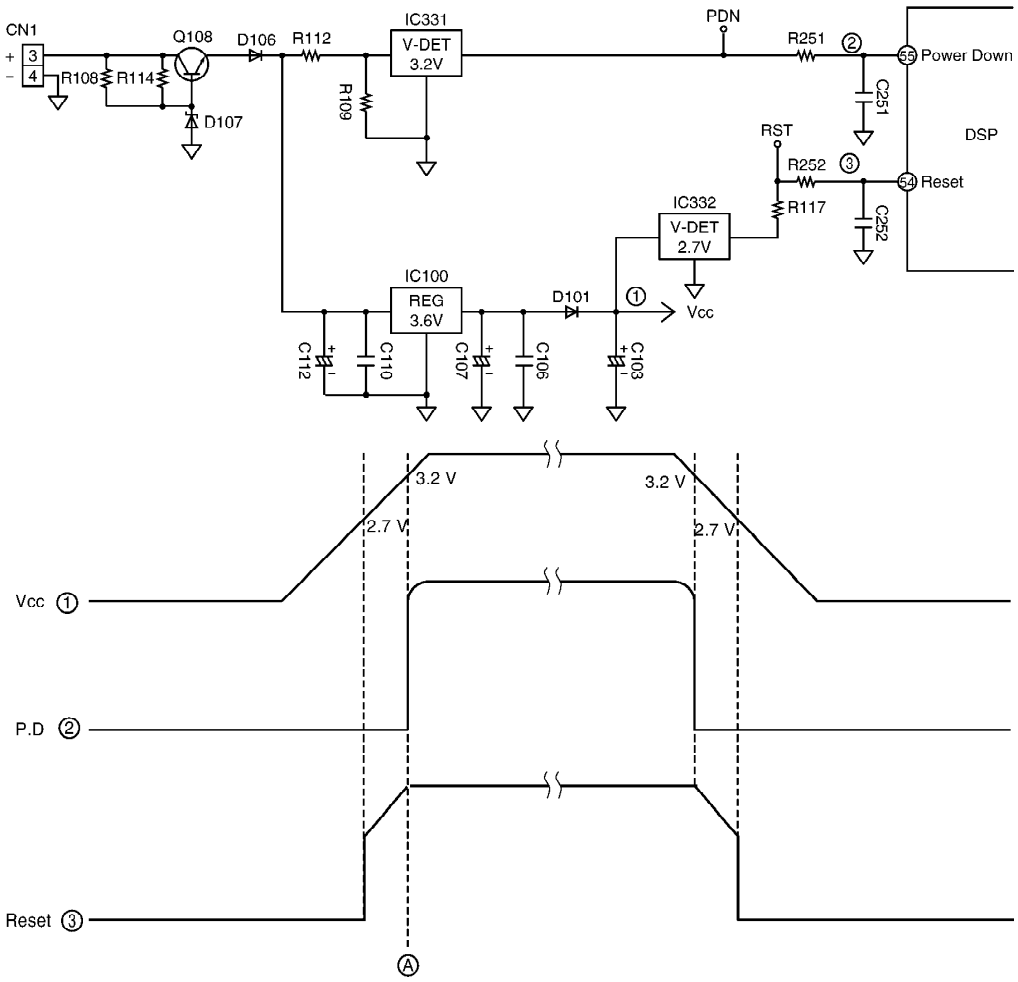
This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC100, D101 and power is supplied to the DSP.

The set can operate beyond point Ⓐ in the circuit voltage diagram.

Circuit Diagram



13.5. Locator/Intercom Mode

1. **When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from pins 29 and 31 of IC201. Thus a monitor tone is heard from the speaker.**
2. **At the same time, flashing of the IN USE/CHARGE (LED202) is obtained from pin 70 of IC201. This status is called "Intercom stand-by".**
3. **The receiving signal flows:**
   RF → pins 29 and 31 of IC201 → SP
4. **The transmission signal flows:**
   MIC → C235, C236 → R213, R214 → pins 46 and 47 of IC201 → RF

13.6. Telephone Line Interface

Telephone Line Interface Circuit:
Function

- Bell signal detection
- ON/OFF hook and pulse dial circuit
- Side tone circuit
- Auto-disconnect circuit/Parallel connection detection circuit

Bell signal detection and OFF HOOK circuit:

In the idle mode, Q4 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:
T → L1 → R30 → C16 → Q6 → DSP pin 27. [BELL]
When the CPU (DSP) detects a ring signal, and press the TALK key onto the handset Q4 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the Loop current.
T → D4 → Q4 → R1/R2 → C1 → R3 → R5 → D1 → D4 → L2 → POS1 → R

ON HOOK Circuit:

Q4 is open, Q4 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

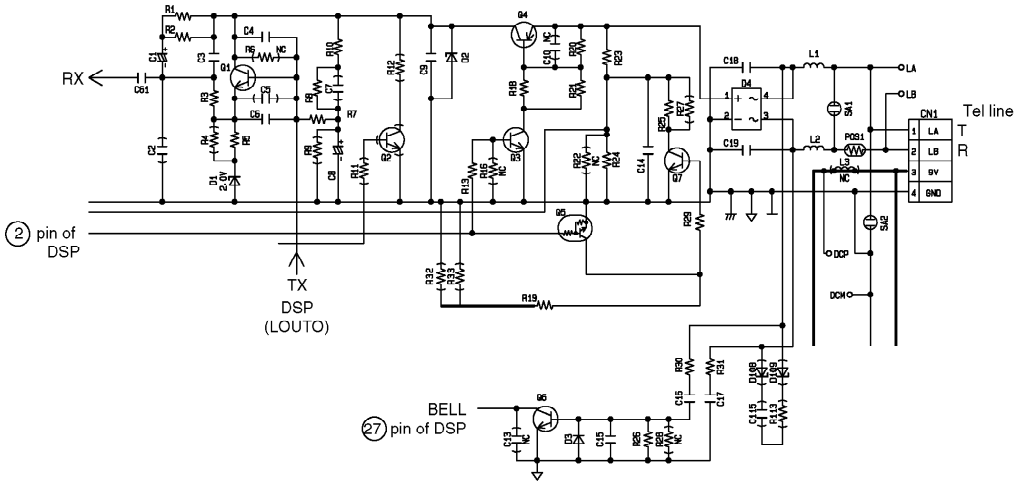
Pulse Dial Circuit:

DSP (2) turns Q4 ON/OFF to make the pulse dialing.

Side Tone Circuit:

Basically this circuit prevents the TX signal from feeding back to RX signal.
As for this unit, TX signal feed back from Q1 is canceled by the chancellor circuit of DSP.

Circuit Diagram



13.7. Auto Disconnect Circuit

Function:

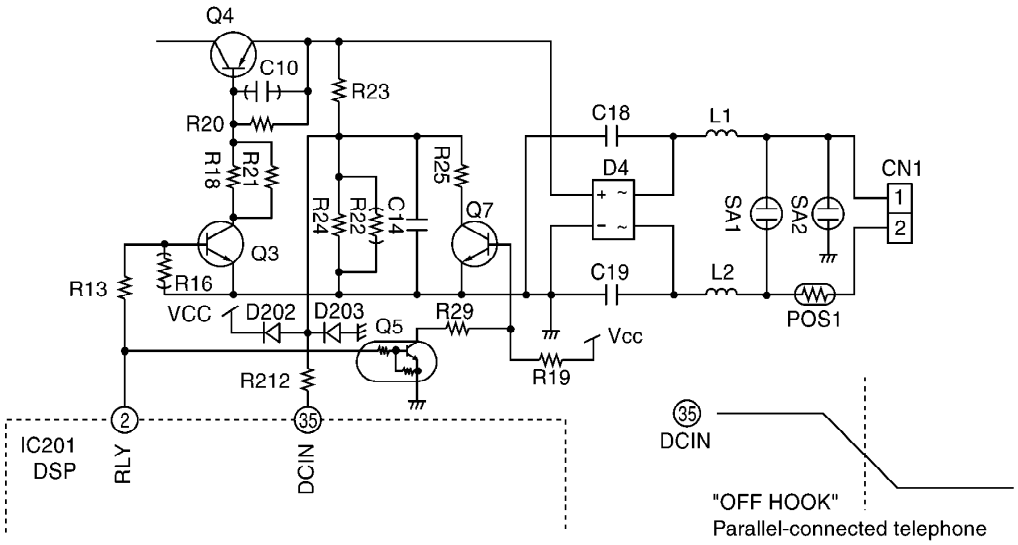
This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status.

Circuit Operation:

The voltage DCIN of DSP is monitored. If a parallel-connected telephone is put into an OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2V or more.

When the set detects the parallel-connected telephone is OFF HOOK status, the line is disconnected.

Circuit Diagram



13.8. Parallel Connection Detect Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

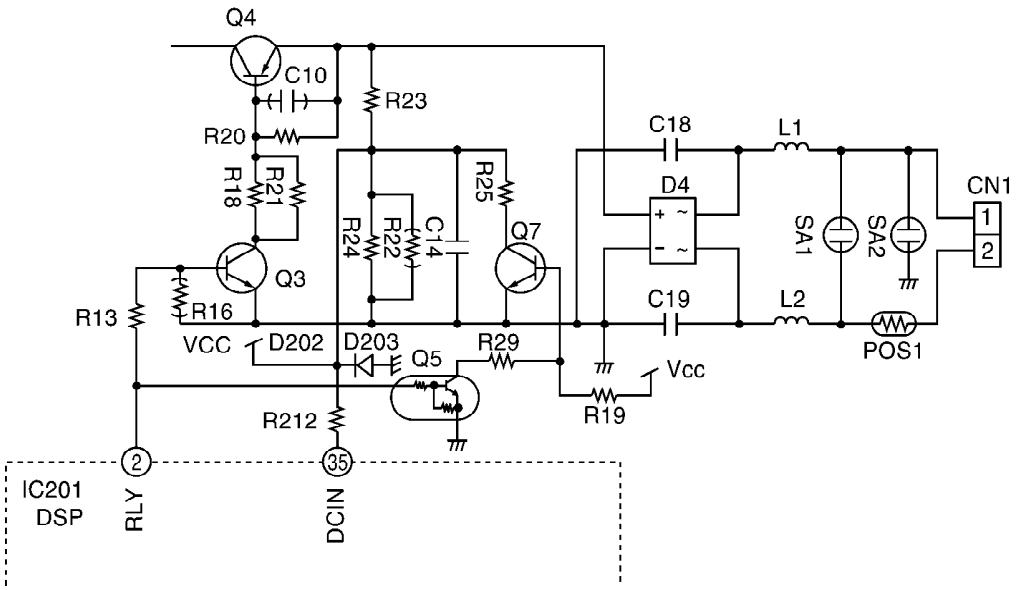
Parallel connection detection when on hook:

When on hook Q7 is ON, the voltage is monitored DCIN of DSP. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook Q7 is OFF, the voltage is monitored DCIN of DSP; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

Circuit Diagram



13.9. Signal Route

Each signal route is as follows.

SIGNAL ROUTE	IN → signal → ROUTE → OUT
SP-PHONE Tx	MIC - C235, R213, C236, R214 - IC201 (46 - 47, 34) - R223, C244, R222 - Q1 - TEL LINE
SP-PHONE Rx	TEL LINE (T/R) - C3 - C61 - R57 - R55 - C58 - Q50 - C57 - C50 - R225 - C413 - IC201 (44, 29 -31) - Speaker
HANDSET Tx	HANDSET MIC - (C232 - R231 / C230 - R229) - IC201 (46 - 47, 57) - RF unit (2) - - - - RF unit (4) - IC201 (66, 34) - R223 - C244 - R222 - Q1 - Q4 - D4 - TEL LINE
HANDSET Rx	TEL LINE - L1 - D4 - Q4 - C3 - C61 - R57 - R55 - C58 - Q50 - C57 - C50 - R225 - C413 - IC201 (44, 57) - RF unit (2) - - - - RF unit (4) - IC201 (66, 33 - 44) - (R302 / C257 - Headset - C301 - R303 - L209) - HANDSET SPEAKER
DTMF SIGNAL TO TEL- LINE	IC201 (34) - R223 - C244 - R222 - Q1 - Q4 - D4 - L1 - TEL LINE

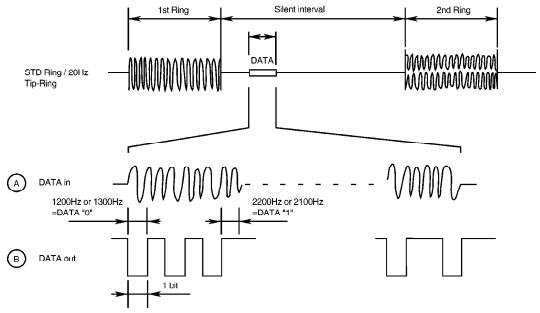
13.10. Calling Line Identification Circuit (Caller ID)

Function:

The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. This model can receive 2 types of caller ID (FSK type, DTMF type).

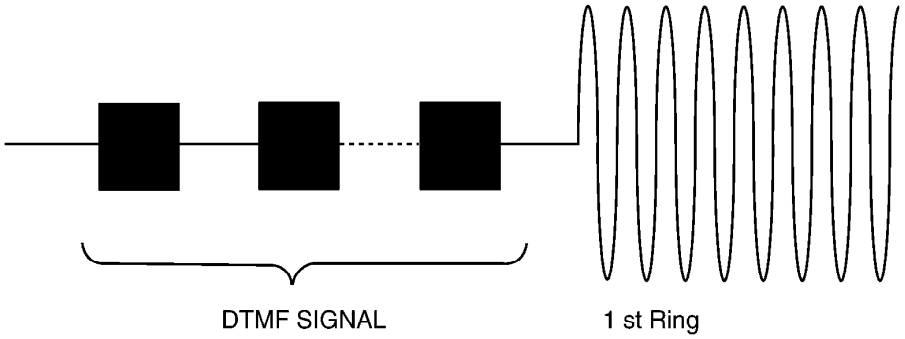
- FSK type

The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data “0” is a 1200 Hz or 1300 Hz sine wave, and data 1 a 2200 Hz or 2100 Hz sine wave.

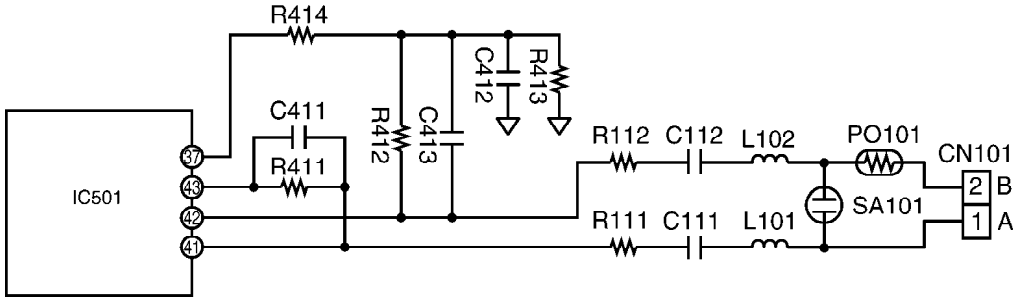


- DTMF type

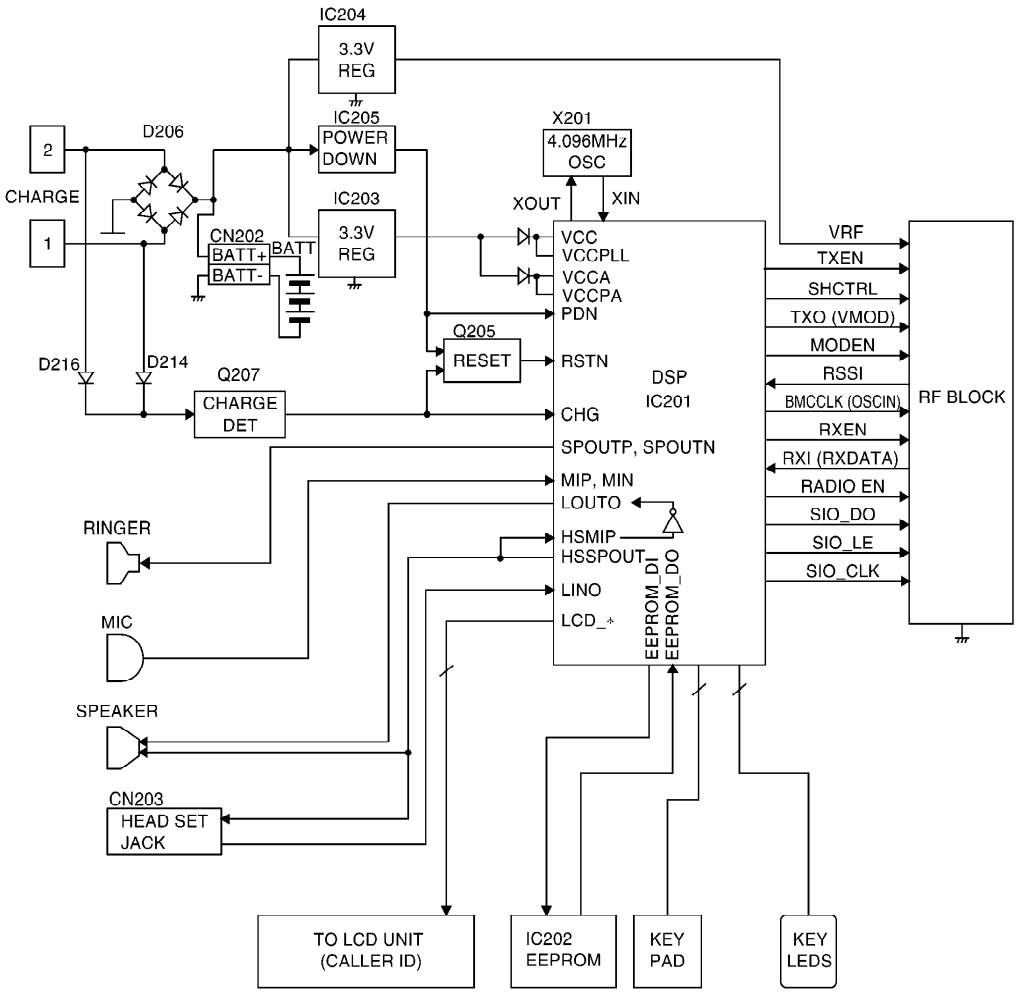
The data for the caller ID from the telphone exchange is DTMF signal.
It is sent before the first ring of bell signal.



Circuit Diagram



14. BLOCK DIAGRAM (Handset)



15. CIRCUIT OPERATION (Handset)

15.1. Construction

The circuit mainly consists of DSP and RF unit as shown in the block diagram.

15.1.1. DSP:IC201

Function

- Battery Low, Power down defect circuit
- Ringer Generation
- Interface circuit
RF unit, speaker, mic, LED, Key scan, LCD, Headset

15.1.2. RF unit

Mainly voice signal is modulated to RF, or it goes the other way.

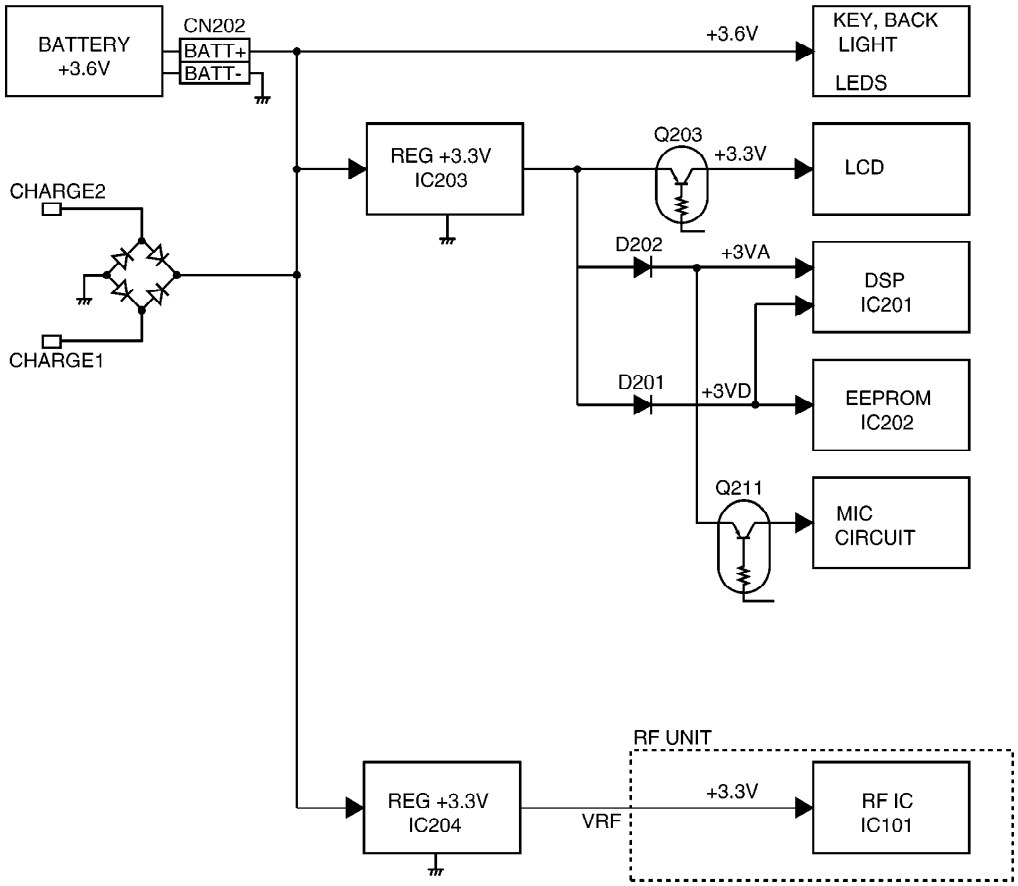
15.1.3. EEPROM: IC202

All setting data is stored.
ex: ID code, user setting (Flash Time, Tone/Pulse)

15.2. Power Supply Circuit

Voltage is supplied separately to each block as shown the Block Diagram below.

Block Diagram (Handset Power)



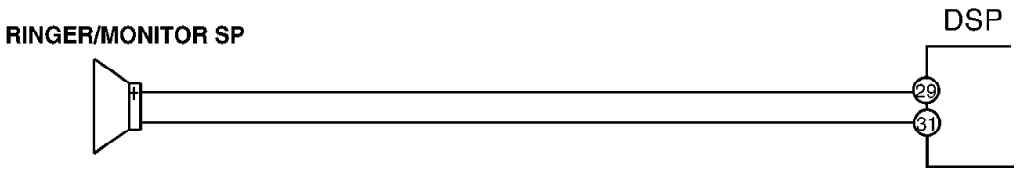
15.3. Charge Circuit

Ni-Cd battery is connected to CN202. When the handset is put on the cradle of the base unit, the power is supplied from CHARGE1 and CHARGE2 terminals to charge the battery. Q207 detects the voltage of CHARGE1 and CHARGE2 terminals, then the handset makes ID code setting with the base unit.

15.4. Ringer and Handset SP-Phone

DSP (29-31) → SP/RINGER

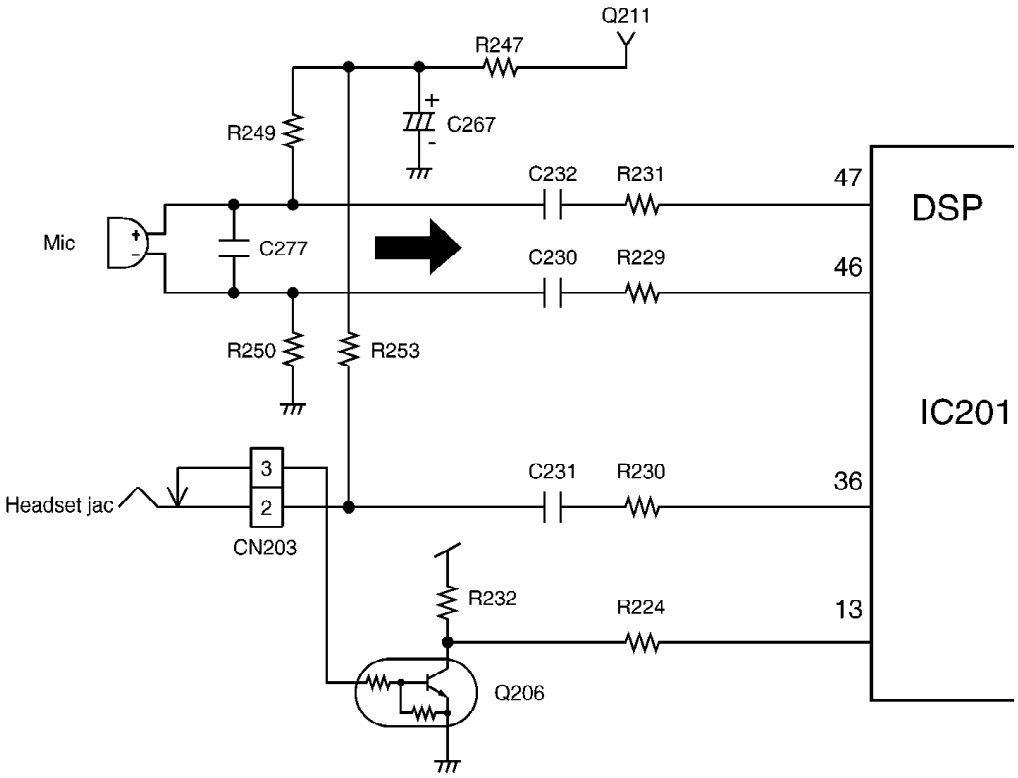
Circuit Diagram



15.5. Sending Signal

The voice signal from the microphone input to DSP (46-47). CN203 is the headset jack. When the headphone is connected, the Q206 detect it. The input from the microphone of the handset (MIN, MIP) is cut and the microphone signal from the headphone is input to DSP (36). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.

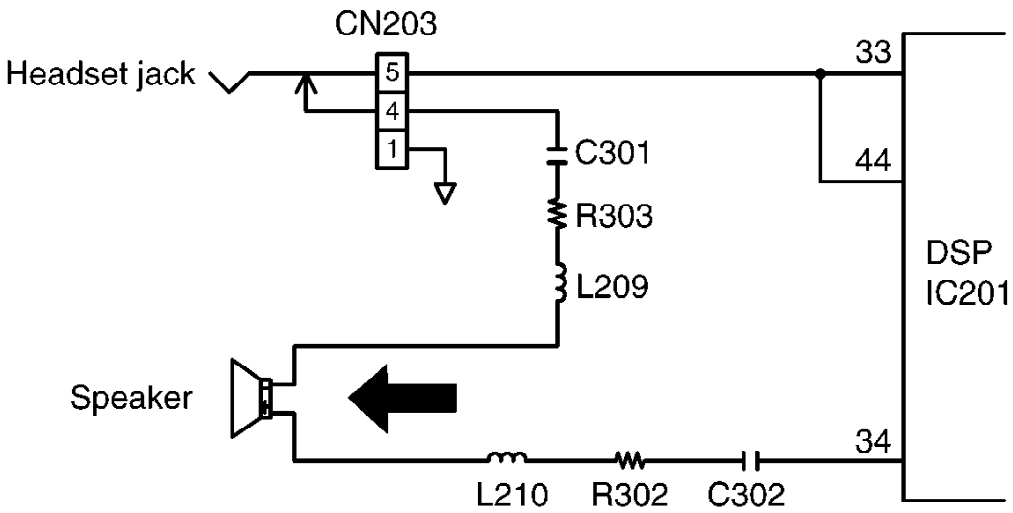
Circuit Diagram



15.6. Reception Signal

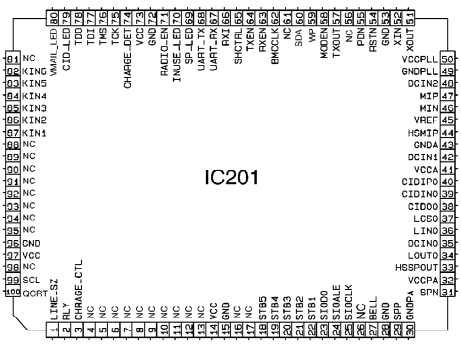
The voice signal from the base unit is output to DSP (33) (HSSOUT). This signal is led to the headset jack (CN203) and DSP (44) (HSMIP). The signal input to DSP (44) is inverted and output to DSP (34) (LOUTO).The signal through the headset jack is inverted, then output from DSP (34) to drive the speaker. When the headset is inserted to the jack, the voice signal is cut at the jack, so the sound does not come out from the speaker, but from the headset only.

Circuit Diagram



16. CPU DATA (Base Unit)

16.1. IC201

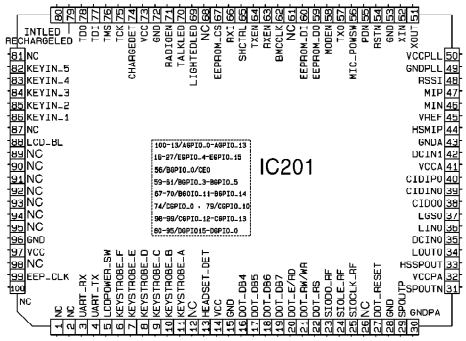


Pin	Description	I/O	High	High_Z	Low
1	LINE_SZ	D.O	On	-	Off
2	RLY	D.O	On	-	Off
3	CHAGEG_CTL	D.O	-	Charge	Non Charge
4	NC	D.O	-	-	Normal
5	NC	D.O	-	-	Normal
6	NC	D.O	-	-	Normal
7	NC	D.O	-	-	Normal
8	NC	D.O	-	-	Normal
9	NC	D.O	-	-	Normal
10	NC	D.O	-	-	Normal
11	NC	D.O	-	-	Normal
12	NC	D.O	-	-	Normal
13	NC	D.O	-	-	Normal
14	VCC	VCC	Vcc	-	-
15	GND	GND	-	-	GND
16	NC	D.O	-	-	Normal
17	NC	D.O	-	-	Normal
18	STB5	D.O	Active	Not	-
19	STB4	D.O	Active	Not	-
20	STB3	D.O	Active	Not	-
21	STB2	D.O	Active	Not	-
22	STB1	D.O	Active	Not	-
23	SIODO	D.O	High	-	Low
24	SIOALE	D.O	Latch	-	Not
25	SIOCLK	D.O	High	-	Low
26	NC	D.O	-	-	Normal
27	BELL	D.I	Off	-	On
28	GND	GND	-	-	GND
29	SPP	A.O	-	-	-
30	GNDPA	GND	-	-	GND
31	SPN	A.O	-	-	-
32	VCCPA	VCC	VCC	-	-
33	HSSPOUT	A.O	-	-	-
34	LOUTO	A.O	-	-	-
35	DCIN0	A.I	-	-	-
36	LINO	A.I	-	-	-
37	LGSO	A.I	-	-	-
38	CIDOO	A.I	-	-	-
39	CIDINO	A.I	-	-	-
40	CIDIPO	A.I	-	-	-
41	VCCA	VCC	VCC	-	-
42	DCIN1	A.I	-	-	-
43	GNDA	GND	-	-	GND
44	HSMIP	A.I	-	-	-
45	VREF	A.O	-	-	-
46	MIN	A.I	-	-	-
47	MIP	A.I	-	-	-
48	DCIN2	A.I	-	-	-
49	GNDPLL	GND	-	-	GND
50	VCCPLL	VCC	VCC	-	-

Pin	Description	I/O	High	High_Z	Low
51	XOUT	A.O	-	-	-
52	XIN	A.I	-	-	-
53	GND	GND	-	-	GND
54	RSTN	D.I	Normal	-	Reset
55	PDN	D.I	Power On	-	Power Down
56	NC	D.O	-	-	Normal
57	TXOUT	D.O	-	-	-
58	MODEN	D.I	-	-	-
59	WP	D.O	WP	-	Write
60	SDA	D.O	High	-	Low
61	NC	D.O	-	-	Normal
62	BMCCLK	D.O	-	-	-
63	RXEN	D.O	-	-	-
64	TXEN	D.O	-	-	-
65	SHCTRL	D.O	-	-	-
66	RXI	D.I	-	-	-
67	UART_RX	D.I	High	-	Low
68	UART_TX	D.O	High	-	Low
69	SP_LED	D.O	-	Off	On
70	INUSE_LED	D.O	-	Off	On
71	RADIO_EN	D.O	-	-	-
72	GND	GND	-	-	GND
73	VCC	VCC	VCC	-	-
74	CHARGE_DET	D.I	Off Charge	-	On Charge
75	TCK	D.O	-	-	-
76	TMS	D.O	-	-	-
77	TDI	D.I	-	-	-
78	TDO	D.O	-	-	-
79	CID_LED	D.O	-	Off	On
80	VMAIL_LED	D.O	On	-	Off
81	NC	D.O	Off	-	Normal
82	KIN6	D.I	Key In	-	Non
83	KIN5	D.I	Key In	-	Non
84	KIN4	D.I	Key In	-	Non
85	KIN3	D.I	Key In	-	Non
86	KIN2	D.I	Key In	-	Non
87	KIN1	D.I	Key In	-	Non
88	NC	D.O	-	-	Normal
89	NC	D.O	-	-	Normal
90	NC	D.O	-	-	Normal
91	NC	D.O	-	-	Normal
92	NC	D.O	-	-	Normal
93	NC	D.O	-	-	Normal
94	NC	D.O	-	-	Normal
95	NC	D.O	-	-	Normal
96	GND	GND	-	-	GND
97	VCC	VCC	VCC	-	-
98	NC	D.O	-	-	Normal
99	SCL	D.O	High	-	Low
100	QCRT	D.O	Stop	-	Normal

17. CPU DATA (Handset)

17.1. IC201

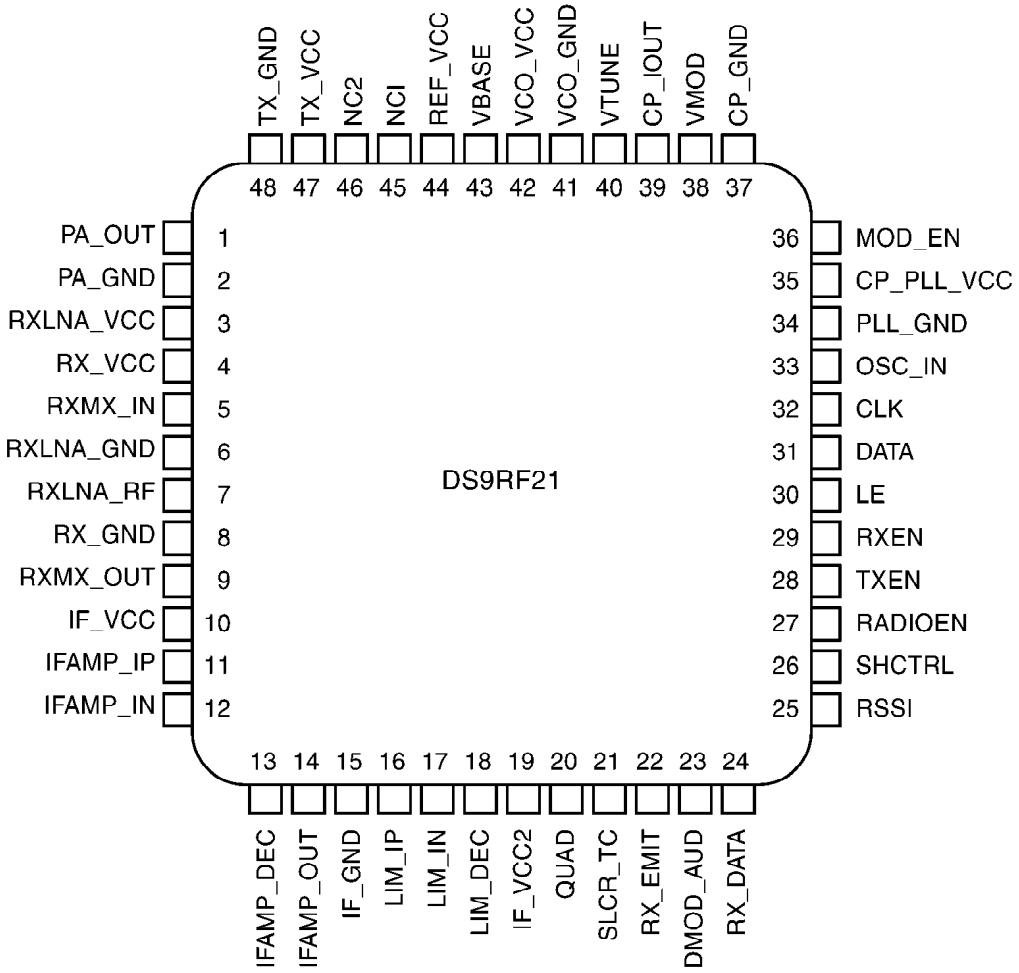


Pin	Description	I/O	High	High_Z	Low
1	NC	D.O	-	-	Normal
2	NC	D.O	-	-	Normal
3	UART_RX	D.I	High	-	Low
4	UART_TX	D.O	High	-	Low
5	LCDPOWER_SW	D.O	Off	-	On
6	KEYSTROBE_F	D.O	-	Not	Active
7	KEYSTROBE_E	D.O	-	Not	Active
8	KEYSTROBE_D	D.O	-	Not	Active
9	KEYSTROBE_C	D.O	-	Not	Active
10	KEYSTROBE_B	D.O	-	Not	Active
11	KEYSTROBE_A	D.O	-	Not	Active
12	NC	D.O	-	-	Normal
13	HEADSET_DET	D.I	Headset In	-	Non
14	VCC	VCC	Vcc	-	-
15	GND	GND	-	-	GND
16	DOT_DB4	D.O	High	-	Low
17	DOT_DB5	D.O	High	-	Low
18	DOT_DB6	D.O	High	-	Low
19	DOT_DB7	D.O	High	-	Low
20	DOT_E/RD	D.O	Active	-	Not
21	DOT_RW/WR	D.O	Read	-	Write
22	DOT_RS	D.O	Data	-	Instruct
23	SIODO_RF	D.O	High	-	Low
24	SIOLE_RF	D.O	Latch	-	Not
25	SIOCLK_RF	D.O	High	-	Low
26	NC	D.O	-	-	Normal
27	DOT_RESET	D.O	Nomal	-	Reset
28	GND	GND	-	-	GND
29	SPOUTP	A.O	-	-	-
30	GNDPA	GND	-	-	GND
31	SPOUTN	A.O	-	-	-
32	VCCPA	VCC	VCC	-	-
33	HSSPOUT	A.O	-	-	-
34	LOUTO	A.O	-	-	-
35	DCINO	A.I	-	-	-
36	LINO	A.I	-	-	-
37	LGSO	A.I	-	-	-
38	CIDOO	A.I	-	-	-
39	CIDINO	A.I	-	-	-
40	CIDIPO	A.I	-	-	-
41	VCCA	VCC	VCC	-	-
42	DCIN1	A.I	-	-	-
43	GNDA	GND	-	-	GND
44	HSMIP	A.I	-	-	-
45	VRFF	A.O	-	-	-
46	MIN	A.I	-	-	-
47	MIP	A.I	-	-	-
48	RSSI	A.I	-	-	-
49	GNDPLL	GND	-	-	GND
50	VCCPLL	VCC	VCC	-	-

Pin	Description	I/O	High	High_Z	Low
51	XOUT	A.O	-	-	-
52	XIN	A.I	-	-	-
53	GND	GND	-	-	GND
54	RSTN	D.I	Normal	-	Reset
55	PDN	D.I	Power On	-	Power Down
56	MIC_POWSW	D.O	Bias Off	-	Bias On
57	TXO	D.O	-	-	-
58	MODEN	D.O	-	-	-
59	EEPROM_DO	D.I	High	-	Low
60	EEPROM_DI	D.O	High	-	Low
61	NC	D.O	-	-	Normal
62	BMCCLK	D.O	-	-	-
63	RXEN	D.O	-	-	-
64	TXEN	D.O	-	-	-
65	SHCTRL	D.O	-	-	-
66	RXI	D.I	-	-	-
67	EEPROM_CS	D.O	Active	-	Not
68	NC	D.O	-	-	Normal
69	LITEDLED	D.O	On	-	Off
70	TALK LED	D.O	Normal	-	-
71	RADIOEN	D.O	-	-	-
72	GND	GND	-	-	GND
73	VCC	VCC	VCC	-	-
74	CHAGEDET	D.I	Off Charge	-	On Charge
75	TCK	D.O	-	-	-
76	TMS	D.O	-	-	-
77	TDI	D.I	-	-	-
78	TDO	D.O	-	-	-
79	RECHAGELED	D.O	Normal	-	-
80	INTLED	D.O	Normal	-	-
81	NC	D.O	Normal	-	-
82	KEYIN_5	D.I	Non	-	Key In
83	KEYIN_4	D.I	Non	-	Key In
84	KEYIN_3	D.I	Non	-	Key In
85	KEYIN_2	D.I	Non	-	Key In
86	KEYIN_1	D.I	Non	-	Key In
87	NC	D.O	Normal	-	-
88	LCD_BL	D.O	On	-	Off
89	NC	D.O	-	-	Normal
90	NC	D.O	-	-	Normal
91	NC	D.O	-	-	Normal
92	NC	D.O	-	-	Normal
93	NC	D.O	-	-	Normal
94	NC	D.O	-	-	Normal
95	NC	D.O	-	-	Normal
96	GND	GND	-	-	GND
97	VCC	VCC	VCC	-	-
98	NC	D.O	-	-	Normal
99	EPP_CLK	D.O	High	-	Low
100	NC	D.O	-	-	Normal

18. EXPLANATION OF IC TERMINALS (RF Unit)

18.1. IC101



Pin	Description	I/O
1	PA_OUT	O
2	PA_GND	O
3	RXLNA_VCC	O&VCC
4	RX_VCC	VCC
5	RXMX_IN	I
6	RXLNA_GND	GND
7	RXLNA_RF	I
8	RX_GND	GND
9	RXMX_OUT	O&VCC
10	IF_VCC	VCC
11	IFAMP_IP	I
12	IFAMP_IN	I
13	IFAMP_DEC	I
14	IFAMP_OUT	O
15	IF_GND	GND
16	LIM_IP	I
17	LIM_IN	I
18	LIM_DEC	I
19	IF_VCC2	VCC
20	QUAD	I
21	SLCR_TC	I

Pin	Description	I/O
25	RSSI	O
26	SHCTRL	I
27	RADIOEN	I
28	TXEN	I
29	RXEN	I
30	LE	I
31	DATA	I
32	CLK	I
33	OSC_IN	I
34	PLL_GND	GND
35	CP_PLL_VCC	VCC
36	MOD_EN	I
37	CP_GND	GND
38	VMOD	I
39	CP_IOUT	O
40	VTUNE	I
41	VCO_GND	GND
42	VCO_VCC	VCC
43	VBASE	I
44	REF_VCC	VCC
45	NCI	N/C

22	RX_EMIT	GND
23	DMOD_AUD	O
24	RX_DATA	O

46	NC2	N/C
47	TX_VCC	VCC
48	TX_GND	GND

19. HOW TO REPLACE FLAT PACKAGE IC

19.1. Preparation

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

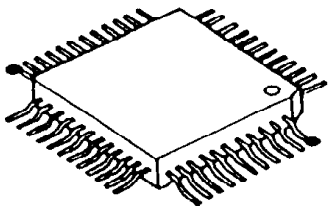
Recommended power consumption will be between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

- Flux

HI115 Specific gravity 0.863.
(Original flux will be replaced daily.)

19.2. Procedure

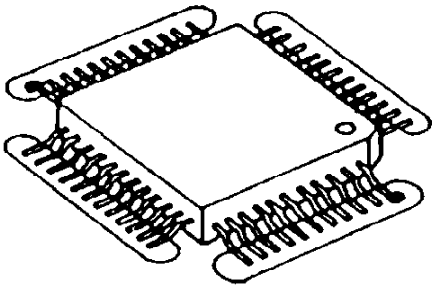
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



● - - - - - - Temporary soldering point.

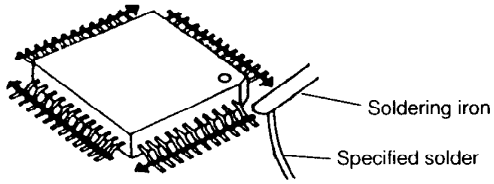
***Most important matter is accurate setting of IC to the corresponding soldering foil.**

2. Apply flux for all pins of FLAT PACKAGE IC.



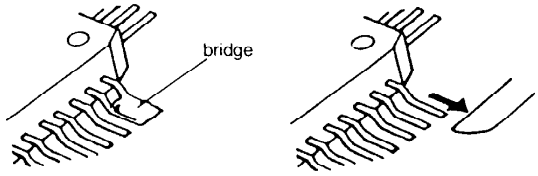
- - - - - - Flux

3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.

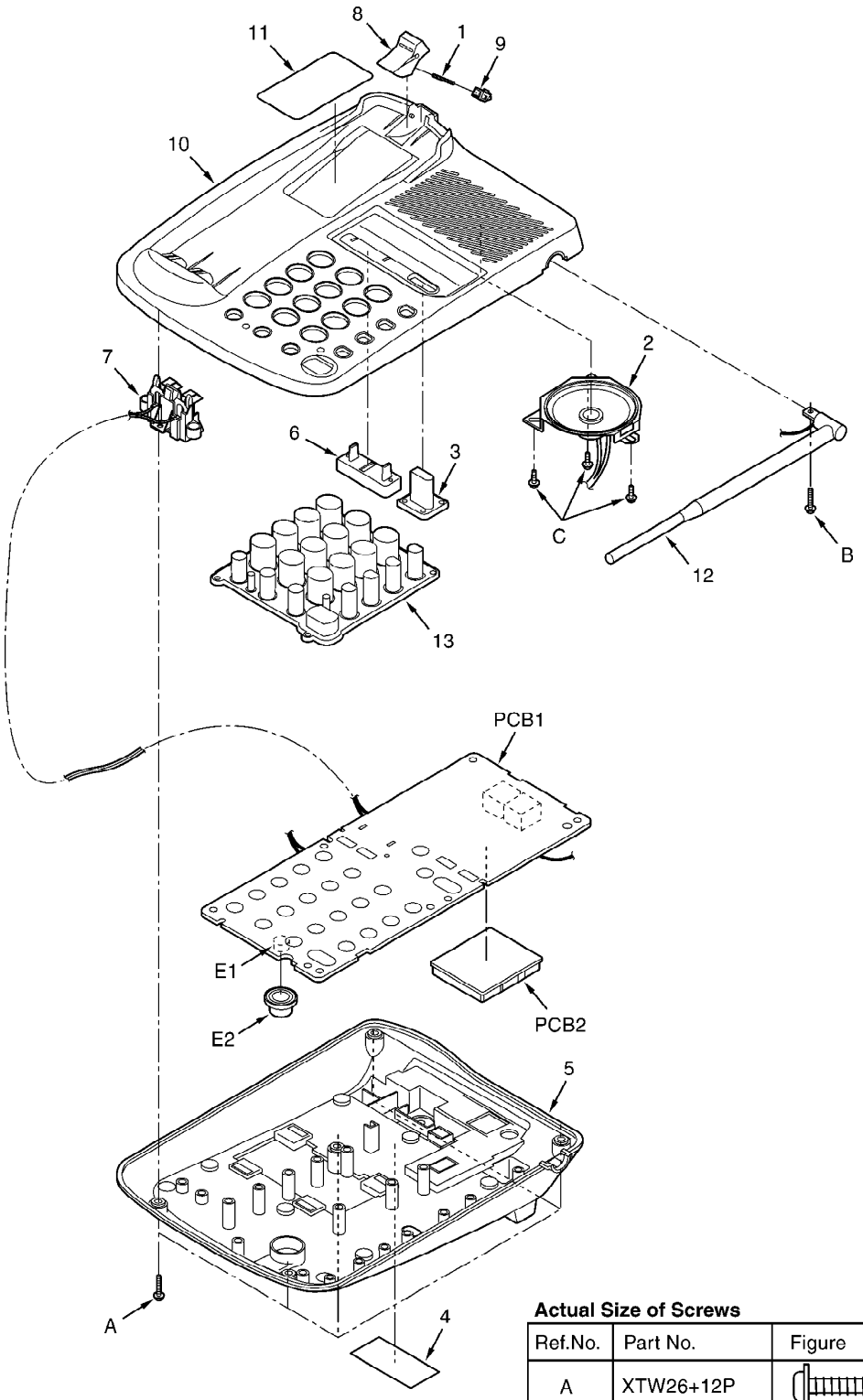


19.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.



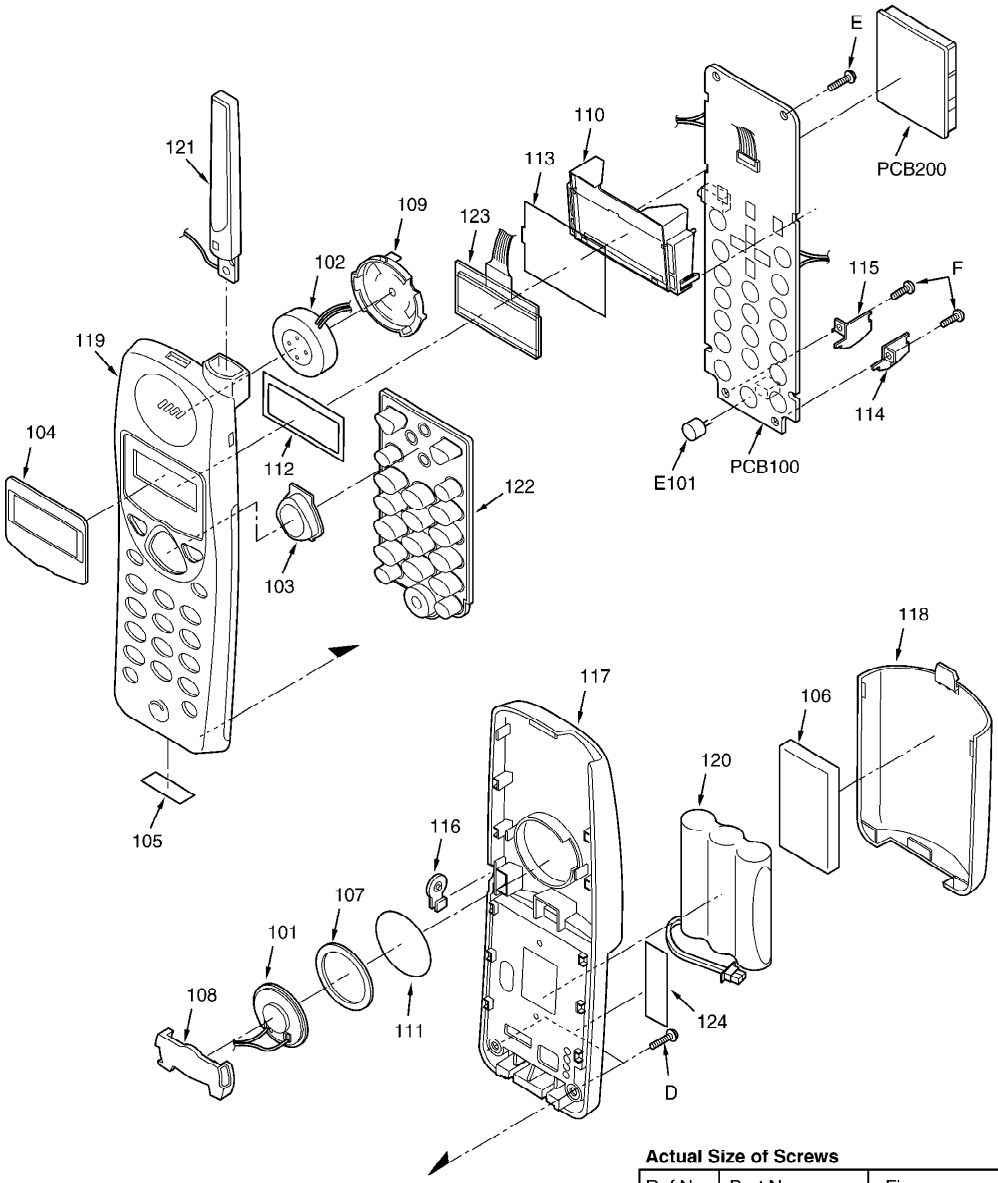
20. CABINET AND ELECTRICAL PARTS (Base Unit)



Actual Size of Screws

Ref.No.	Part No.	Figure
A	XTW26+12P	
B	XTW26+12P	
C	XTW3+S8P	

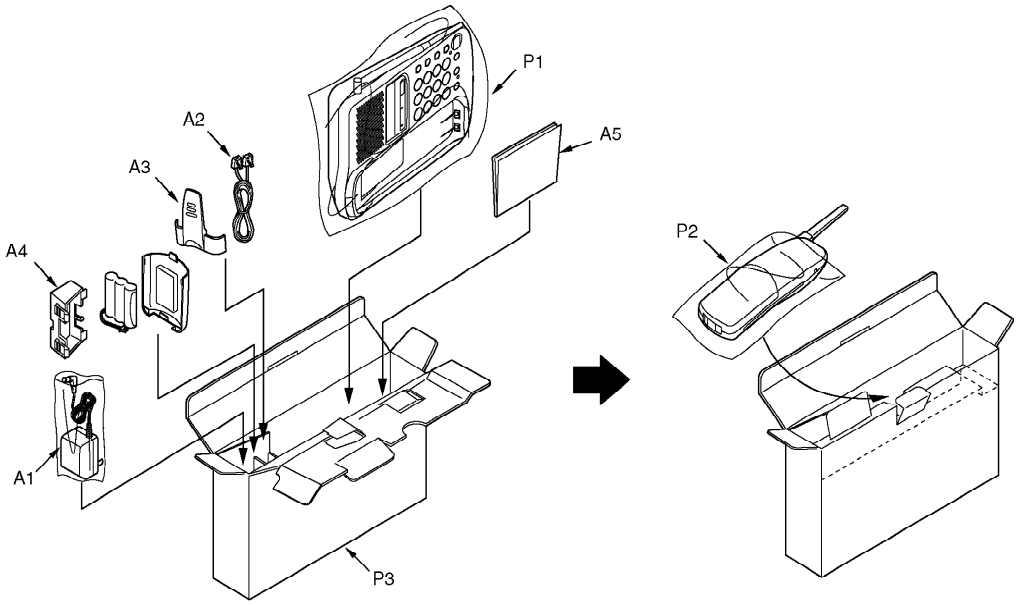
21. CABINET AND ELECTRICAL PARTS (Handset)



Actual Size of Screws

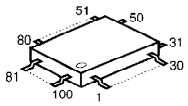
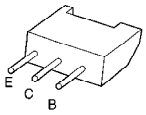
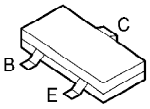
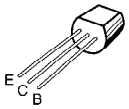
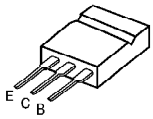
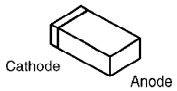
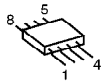
Ref.No.	Part No.	Figure
D	XTW26+12P	
E	XTW26+12P	
F	XTW26+10J	

22. ACCESSORIES AND PACKING MATERIALS

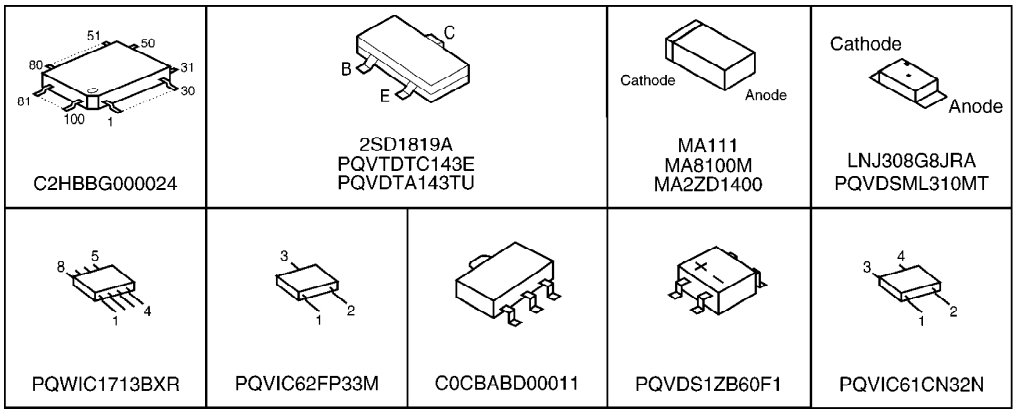


23. TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

23.1. Base Unit

Cathode Anode PQVDRLZ2R0 PQVDRLZ20A	 C2HBBG000026	 2SD1994A	 2SD1758Q	 UN5213 2SD1819A C0EBE0000142
 2SC2120 2SA1625 PQVT2N6517CA	 2SD2136	 PQVDS1ZB60F1	 MA111 MA8039 MA8068M PQVDHRU0302A	
 PQWIC1713BXH	 C0CBABD00013	Cathode PQVDEL1921SR PQVDSML310MT		

23.2. Handset



24. REPLACEMENT PARTS LIST

This replacement parts list are KX-TC1713BXB only.

Note:

1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.

After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by a ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ μ F

***Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

24.1. Base Unit

24.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQUS10285Z	HOOK SPRING	
2	PQAS57P03Y	SPEAKER	
3	PQSX10178Z	VOICE MAIL RUBBER SWITCH	
4	PQGT14894Z	NAME LABEL	
5	PQYF10196X1	LOWER CABINET	S
6	PQHR10863Z	LED LENSE	
7	PQWE10022Z	CHARGE TERMINAL	
8	PQKE10131Z1	HOOK LEVER	S
9	PQKE10134Z1	HOOK KNOB	S
10	PQKM10485Y1	UPPER CABINET	S
11	PQQT22303Z	CHARGE LABEL	
12	PQSA10095Z	ANTENNA	
13	PQSX10172Z	12 KEY RUBBER SWITCH	

24.1.2. MAIN P.C. BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPC1713BXH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC100	C0CBABD00013	IC	
IC201	C2HBBG000026	IC	
IC202	PQWIC1713BXH	IC	
IC332	C0EBE0000142	IC	
		(TRANSISTORS)	
Q1	2SC2120	TRANSISTOR(SI)	S
Q3	PQVT2N6517CA	TRANSISTOR(SI)	S
Q4	2SA1625	TRANSISTOR(SI)	S
Q5	UN5213	TRANSISTOR(SI)	S
Q6	2SD1819A	TRANSISTOR(SI)	
Q7	2SD1819A	TRANSISTOR(SI)	
Q50	2SD1819A	TRANSISTOR(SI)	
Q104	2SD1758Q	TRANSISTOR(SI)	S
Q108	2SD2136	TRANSISTOR(SI)	
Q150	2SD1994A	TRANSISTOR(SI)	
Q151	2SD1819A	TRANSISTOR(SI)	
Q200	2SD1819A	TRANSISTOR(SI)	
Q900	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D1	PQVDRLZ2R0	DIODE(SI)	S
D2	PQVDRLZ20A	DIODE(SI)	S
D3	MA111	DIODE(SI)	
D4	PQVDS1ZB60F1	DIODE(SI)	
D101	PQVDHRU0302A	DIODE(SI)	S
D102	PQVDHRU0302A	DIODE(SI)	S
D103	MA8039	DIODE(SI)	
D105	PQVDHRU0302A	DIODE(SI)	S
D106	PQVDHRU0302A	DIODE(SI)	S
D107	MA8068M	DIODE(SI)	
D152	PQVDRLZ20A	DIODE(SI)	S
D153	PQVDRLZ20A	DIODE(SI)	S
D202	MA111	DIODE(SI)	
D203	MA111	DIODE(SI)	
		(LEDS)	
LED201	PQVDEL1921SR	LED	
LED202	PQVDSML310MT	LED	S
LED203	PQVDEL1921SR	LED	
LED205	PQVDEL1921SR	LED	
		(COILS)	
L1	PQLQXF330K	COIL	S
L2	PQLQXF330K	COIL	S
L150	PQLQZK3R3K	COIL	S
L151	PQLQXF330K	COIL	S
L200	PQLQR2KA213	COIL	S
L201	PQLQR4RB601D	COIL	
		(SURGE ABSORBERS)	
SA1	PQVDDSS301L	SURGE ABSORBER	S
SA2	PQVDDSS301L	SURGE ABSOBER	S
		(OTHERS)	
CN1	PQJJ2H003Z	JACK SOCKET	S
E1	PQJM147Y	MICROPHONE	
E2	PQMG10023Z	CUSHION RUBBER@ MIC	

Ref. No.	Part No.	Part Name & Description	Remarks
G401	PQJT10152Z	CHARGE TERMINAL	
G402	PQJT10152Z	CHARGE TERMINAL	
G403	PQJT10152Z	CHARGE TERMINAL	
G404	PQJT10152Z	CHARGE TERMINAL	
G405	PQJT10152Z	CHARGE TERMINAL	
G406	PQJT10152Z	CHARGE TERMINAL	
POS1	PQRPAR390N	POSISOTR	S
X200	H0D409400014	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R1	ERJ3GEYJ122	1.2k	
R2	ERJ3GEYJ681	680	
R3	ERJ3GEYJ470	47	
R5	ERDS1TJ330	33	S
R7	ERJ3GEYJ393	39k	
R8	ERJ3GEY0R00	0	
R10	ERJ3GEYJ102	1k	
R13	ERJ3GEYJ473	47k	
R14	ERJ3GEYJ394	390k	
R15	ERJ3GEYJ394	390k	
R17	ERJ3GEYJ473	47k	
R18	ERJ3GEYJ103	10k	
R19	ERJ3GEYJ563	56k	
R20	ERD25TJ104	100k	S
R21	ERJ3GEYJ103	10k	
R23	ERDS1VJ106	10M	
R24	ERJ3GEYJ275	2.7M	
R25	ERJ3GEYJ155	1.5M	
R26	ERJ3GEYJ472	4.7k	
R29	ERJ3GEYJ472	4.7k	
R30	ERJ3GEYJ104	100k	
R31	ERJ3GEYJ104	100k	
R50	ERJ3GEYJ102	1k	
R51	ERJ3GEYJ470	47	
R52	ERJ3GEYJ394	390k	
R55	ERJ3GEYJ102	1k	
R57	ERJ3GEY0R00	0	
R70	ERJ3GEYJ392	3.9k	
R105	ERJ3GEYJ103	10k	
R107	ERJ3GEYJ331	330	
R114	ERDS1TJ181	180	S
R116	ERJ3GEY0R00	0	
R117	ERJ3GEY0R00	0	
R118	ERJ3GEY0R00	0	
R150	ERJ3GEYJ104	100k	
R151	ERJ3GEYJ561	560	
R152	ERJ3GEYJ331	330	
R153	ERDS1TJ100	10	S
R157	ERDS1VJ271	270	
R159	ERJ3GEYJ103	10k	
R160	ERJ3GEYJ563	56k	
R161	ERJ3GEYJ563	56k	
R200	ERJ3GEYJ101	100	
R201	ERJ3GEYJ101	100	
R203	ERJ3GEYJ473	47k	

Ref. No.	Part No.	Part Name & Description	Remarks
R205	ERJ3GEYJ681	680	
R206	ERJ3GEYJ181	180	
R207	ERJ3GEYJ561	560	
R208	ERJ3GEYJ472	4.7k	
R210	ERJ3GEYJ103	10k	
R211	ERJ3GEYJ103	10k	
R212	ERJ3GEYJ102	1k	
R213	ERJ3GEYJ102	1k	
R214	ERJ3GEYJ102	1k	
R215	ERJ3GEYJ222	2.2k	
R216	ERJ3GEYJ222	2.2k	
R217	ERJ3GEYJ394	390k	
R218	ERJ3GEYJ123	12k	
R219	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ333	33k	
R223	ERJ3GEYJ222	2.2k	
R224	ERJ3GEYJ394	390k	
R225	ERJ3GEYJ102	1k	
R227	ERJ3GEYJ222	2.2k	
R231	ERJ3GEYJ221	220	
R232	ERJ3GEYJ221	220	
R234	ERJ3GEYJ221	220	
R251	ERJ3GEYJ102	1k	
R252	ERJ3GEYJ102	1k	
R299	ERJ3GEYJ471	470	
R400	ERJ3GEYJ332	3.3k	
R900	ERJ3GEYJ472	4.7k	
R901	ERJ3GEYJ472	4.7k	
R905	ERJ3GEYJ221	220	
R906	ERJ3GEYJ472	4.7k	
R909	ERJ3GEYJ101	100	
R910	ERJ3GEYJ472	4.7k	
R911	ERJ3GEYJ472	4.7k	
R912	ERJ3GEYJ472	4.7k	
C57	ERJ3GEY0R00	0	
C61	ERJ3GEY0R00	0	
J2	ERJ3GEY0R00	0	
J201	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECEA1CKA100	10	
C3	ECUV1C473KBV	0.047	
C4	ECUV1H101JCV	100P	
C6	ECUV1H103KBV	0.01	
C8	ECEA1HKA010	1	
C9	ECUV1H103KBV	0.01	S
C11	ECUV1H681JCV	680P	S
C12	ECUV1H681JCV	680P	S
C14	ECUV1H103KBV	0.01	
C15	PQCUV1A684KB	0.68	
C16	PQCUV1H154KR	0.15	
C17	PQCUV1H154KR	0.15	
C18	ECKD2H681KB	680P	S
C19	ECKD2H681KB	680P	S
C50	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C55	ECUV1H102KBV	0.001	S
C58	ECUV1C104KBV	0.1	
C70	ECEV0JA220	22	
C100	ECUV1C104ZFV	0.1	
C101	ECEV0JA101	100	
C103	ECEA0JU102	1000	
C106	ECUV1C104ZFV	0.1	
C107	ECEV0JA220	22	
C108	ECEV0JA101	100	
C109	ECUV1H103KBV	0.01	S
C110	ECUV1C104ZFV	0.1	
C112	ECEA1AKA101	100	
C114	ECEA1CKS220	22	S
C150	ECUV1C104ZFV	0.1	
C200	ECUV1C104ZFV	0.1	
C201	ECUV1H681JCV	680P	S
C207	ECUV1C104ZFV	0.1	
C213	ECUV1C104ZFV	0.1	
C221	ECUV1C104ZFV	0.1	
C227	ECUV1H180JCV	18P	
C228	ECUV1H150JCV	15P	
C230	ECST0JY106	10	
C231	ECUV1C104ZFV	0.1	
C234	ECUV1H103KBV	0.01	S
C235	ECUV1H103KBV	0.01	
C236	ECUV1H103KBV	0.01	
C237	ECST0JY106	10	
C238	ECUV1H103KBV	0.01	S
C239	ECEA0JU331	330	
C241	ECUV1C104ZFV	0.1	
C242	ECUV1H272KBV	0.0027	
C244	ECUV1C104KBV	0.1	
C245	ECUV1H121JCV	120P	
C250	ECUV1C104KBV	0.1	
C251	ECUV1C104ZFV	0.1	
C252	ECUV1C104ZFV	0.1	
C401	ECUV1H103KBV	0.01	S
C403	ECUV1H330JCV	33P	
C404	ECUV1H101JCV	100P	
C405	ECUV1H101JCV	100P	
C406	ECUV1H101JCV	100P	
C407	ECUV1H101JCV	100P	
C408	ECUV1H101JCV	100P	
C409	ECUV1H030CCV	3P	
C410	ECUV1H101JCV	100P	
C411	ECUV1H101JCV	100P	
C412	ECUV1H101JCV	100P	
C413	ECUV1C104KBV	0.1	
C415	ECEV0JA220	22	
C450	ECEV0JA101	100	
C453	ECUV1H030CCV	3P	
C723	ECUV1C563KBV	0.056	

24.1.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQLP10246Z	RF BLOCK	

24.2. Handset

24.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQAS3P07Y	SPEAKER	
102	PQAX3P27Z	RECEIVER	
103	PQBC10337Z1	NAVIGATOR BUTTON	S
104	PQGP10183Z1	LCD PANEL	S
105	PQGT14895Z	NAME LABEL	
106	PQHE10121Z	CUSHION URETHANE FORM	
107	PQHG10589Y	SPEAKER RUBBER SHEET	
108	PQHR10778Z	SPEAKER HOLDER	
109	PQHR10855Z	LCD HOLDER	
110	PQHR10856Z	LCD HOLDER	
111	PQHS10457Z	SPEAKER NET	
112	PQHS10470Z	CUSHION LCD	
113	PQHX11005Z	LCD SHEET	
114	PQJT10176Z	CHARGE TERMINAL (L)	
115	PQJT10177Z	CHARGE TERMINAL (R)	
116	PQKE10132Z1	EARPHONE CAP	S
117	PQKF10521X1	REAR CABINET	S
118	PQKK10121Z1	BATERY COVER	S
119	PQKM10493X6	FRONT CABINET	S
120	PQPP504SVC	BATTERY	S
121	PQSA10102X	ANTENNA	S
122	PQSX10174Q	RUBBER SWITCH	
123	PQADGP332GN2	LIQUID CRYSTAL DISPLAY	
124	PQQT22372Z	PRODUCTION LABEL	

24.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPC1713BXR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC201	C2HBBG000024	IC	
IC202	PQWIC1713BXR	IC	
IC203	C0CBABD00011	IC	
IC204	PQVIC62FP33M	IC	S
IC205	PQVIC61CN32N	IC	S
		(TRANSISTORS)	
Q201	PQVTDTC143E	TRANSISTOR(SI)	S
Q202	PQVTDTC143E	TRANSISTOR(SI)	S
Q203	PQVTDTA143TU	TRANSISTOR(SI)	
Q205	2SD1819A	TRANSISTOR(SI)	
Q206	PQVTDTC143E	TRANSISTOR(SI)	S
Q207	2SD1819A	TRANSISTOR(SI)	
Q211	PQVTDTA143TU	TRANSISTOR(SI)	
		(DIODES)	
D201	MA2ZD1400	DIODE(SI)	
D203	MA111	DIODE(SI)	
D206	PQVDS1ZB60F1	DIODE(SI)	
D211	MA8100M	DIODE(SI)	
D214	MA111	DIODE(SI)	
D215	MA2ZD1400	DIODE(SI)	
D216	MA111	DIODE(SI)	
		(LEDS)	
LED201	PQVDSML310MT	LED	S
LED202	PQVDSML310MT	LED	S
LED203	PQVDSML310MT	LED	S
LED204	PQVDSML310MT	LED	S
LED205	LNJ308G8JRA	LED	
LED206	LNJ308G8JRA	LED	
LED207	LNJ308G8JRA	LED	
		(COILS)	
L201	MQLRE15NJF	COIL	
L203	PQLQR3FL121	COIL	S
L211	PQLQR4RB601D	COIL	
L212	PQLQR4RB601D	COIL	
		(CONNECTORS)	
CN201	PQJS22A12Z	FFC CONNECTOR	S
CN202	PQJP2D13Z	CONNECTOR PIN	S
CN203	PQJJ1J007Z	EAR JACK	S
		(OTHERS)	
E101	PQJM147Y	MICROPHONE	
G1	PQJT10152Z	CHARGE TERMINAL	
G2	PQJT10152Z	CHARGE TERMINAL	
G3	PQJT10152Z	CHARGE TERMINAL	
G4	PQJT10152Z	CHARGE TERMINAL	
G5	PQJT10152Z	CHARGE TERMINAL	
G6	PQJT10152Z	CHARGE TERMINAL	
X201	H0J409400006	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R201	ERJ3GEYJ331	330	
R202	ERJ3GEYJ331	330	
R203	ERJ3GEYJ331	330	
R204	ERJ3GEYJ331	330	

Ref. No.	Part No.	Part Name & Description	Remarks
R205	ERJ3GEYJ271	270	
R206	ERJ3GEYJ271	270	
R207	ERJ3GEYJ271	270	
R209	ERJ3GEYJ102	1k	
R210	ERJ3GEYJ103	10k	
R211	ERJ3GEYJ103	10k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R217	ERJ3GEYF434	430k	S
R218	ERJ3GEYF824	820k	S
R222	ERJ3GEYJ101	100	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.7k	
R228	ERJ3GEYJ224	220k	
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEYJ225	2.2M	
R235	ERJ3GEYJ225	2.2M	
R236	ERJ3GEYJ473	47k	
R241	ERJ3GEY0R00	0	
R244	ERJ3GEYJ473	47k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEYJ393	39k	
R249	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ222	2.2k	
R253	ERJ3GEYJ222	2.2k	
R260	ERJ3GEYJ103	10k	
R265	ERJ3GEYJ103	10k	
R270	ERJ3GEYJ104	100k	
R271	ERJ3GEYJ104	100k	
R272	ERJ3GEYJ104	100k	
R300	ERJ3GEYJ104	100k	
R301	ERJ3GEY0R00	0	
R302	ERJ3GEYJ180	18	
R303	ERJ3GEYJ180	18	
C301	ERJ3GEY0R00	0	
L209	PQ4R10XJ000	0	S
		(CAPACITORS)	
C203	ECUV1C104ZFV	0.1	
C205	ECUV1H101JCV	100P	
C206	ECUV1C104KBV	0.1	
C207	ECUV1C104KBV	0.1	
C208	ECUV1C104KBV	0.1	
C209	ECUV1C104KBV	0.1	
C210	ECUV1C104KBV	0.1	
C211	ECUV1A474KBV	0.47	
C212	ECUV1A474KBV	0.47	
C213	ECEV0JA101	100	
C214	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C215	ECUV1A474KBV	0.47	
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C220	ECEV0GA102P	1000	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZFV	0.1	
C225	ECUV1C104ZFV	0.1	
C226	ECUV1C104ZFV	0.1	
C227	ECUV1C104ZFV	0.1	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1A105ZFV	1	
C230	ECUV1E333KBV	0.033	
C231	ECUV1A224KBV	0.22	
C232	ECUV1E333KBV	0.033	
C233	ECUV1A105ZFV	1	
C234	ECUV1A224KBV	0.22	
C236	ECUV1H150JCV	15P	
C237	ECUV1H150JCV	15P	
C239	ECUV1C104ZFV	0.1	
C242	ECUV1C104ZFV	0.1	
C255	ECUV1A224KBV	0.22	
C257	ECST0JY226	22	
C262	ECUV1A105ZFV	1	
C267	ECST0JX226	22	
C270	ECST0JY475	4.7	
C274	ECUV1C104ZFV	0.1	
C277	ECUV1C563KBV	0.056	
C279	ECUV1H010CCV	1P	
C280	ECUV1C104ZFV	0.1	
C282	ECUV1C104ZFV	0.1	
C285	ECUV1C105ZF	1	
C291	ECUV1C104ZFV	0.1	
C294	ECUV1C104ZFV	0.1	
C303	ECST0JY106	10	
C304	ECUV1C104ZFV	0.1	
C305	ECUV1H030CCV	3P	

24.2.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQLP10246Z	RF BLOCK	

24.2.4. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	KX-TCA1BX	AC ADAPTOR	⚠
A2	PQJA10075Z	TEL CORD	
A3	PQKE10130Z1	BELT CLIP	S
A4	PQKL10035Z1	WALL MOUNT ADAPTOR	S
A5	PQQX13197Z	INSTRUCTION BOOK	
P1	PQPP170Y	POLY BAG (for Base Unit)	
P2	XZB10X35A02	POLY BAG (for Handset)	
P3	PQPK13516Z	CARTON BOX	

25. FOR SCHEMATIC DIAGRAM

25.1. Base Unit (SCHEMATIC DIAGRAM (Base Unit))

Notes:

1. **DC voltage measurements are taken with voltmeter from the negative voltage line.**

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. **This schematic diagrams and circuit board may be modified at any time with the development of new technology.**

25.2. Handset (SCHEMATIC DIAGRAM (Handset))

Notes:

1. **DC voltage measurements are taken with an oscilloscope or a tester with a ground.**
2. **The schematic diagrams and circuit board may be modified at any time with the development of new technology.**

25.3. Memo

26. SCHEMATIC DIAGRAM (RF Unit)

27. SCHEMATIC DIAGRAM (Base Unit)

28. SCHEMATIC DIAGRAM (Handset)

29. CIRCUIT BOARD (RF Unit)

30. CIRCUIT BOARD (Base Unit)

30.1. Component View

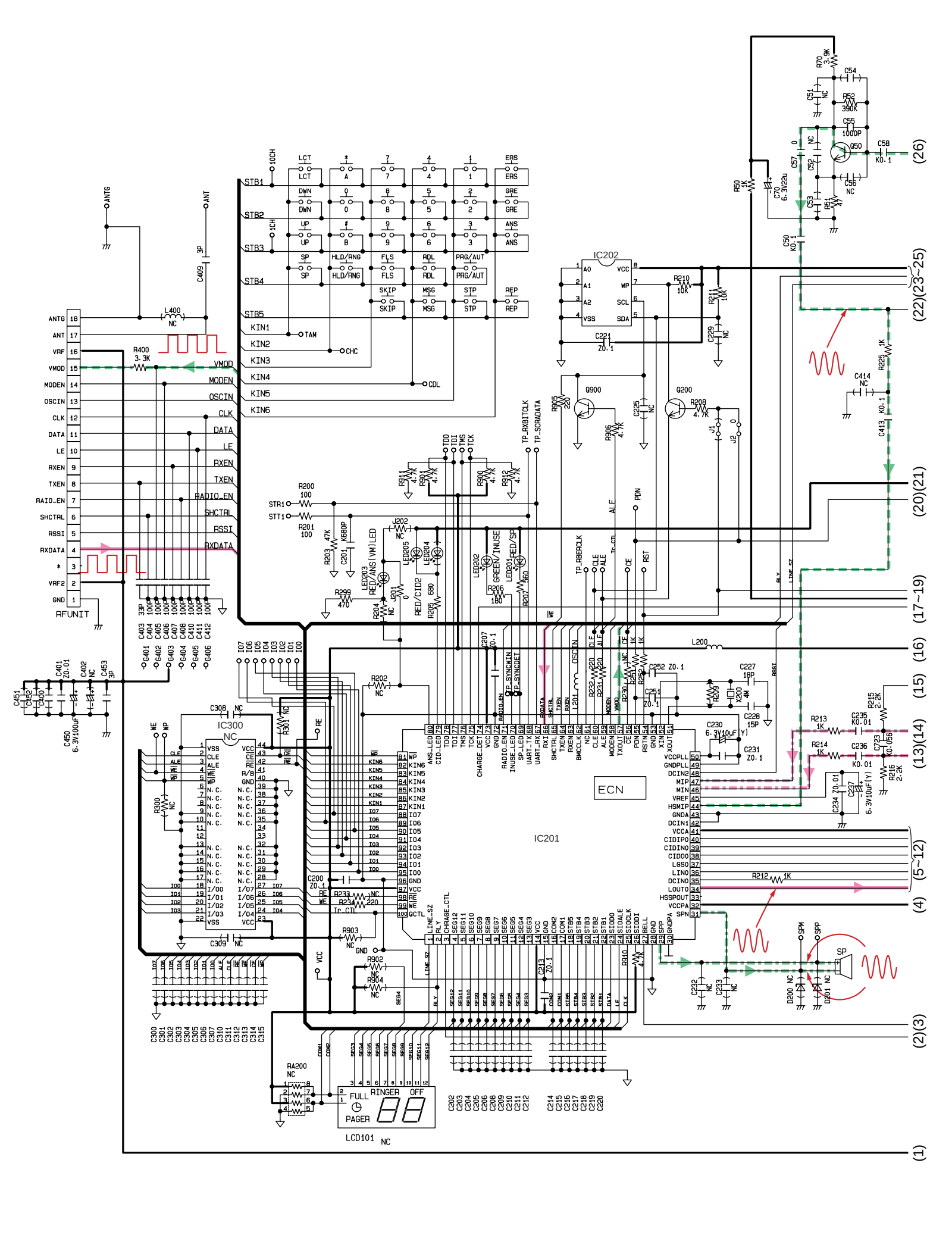
30.2. Flow Solder Side View

31. CIRCUIT BOARD (Handset)

31.1. Component View

31.2. Flow Solder Side View

M / KXTC1713BXB-AK / Printed in Japan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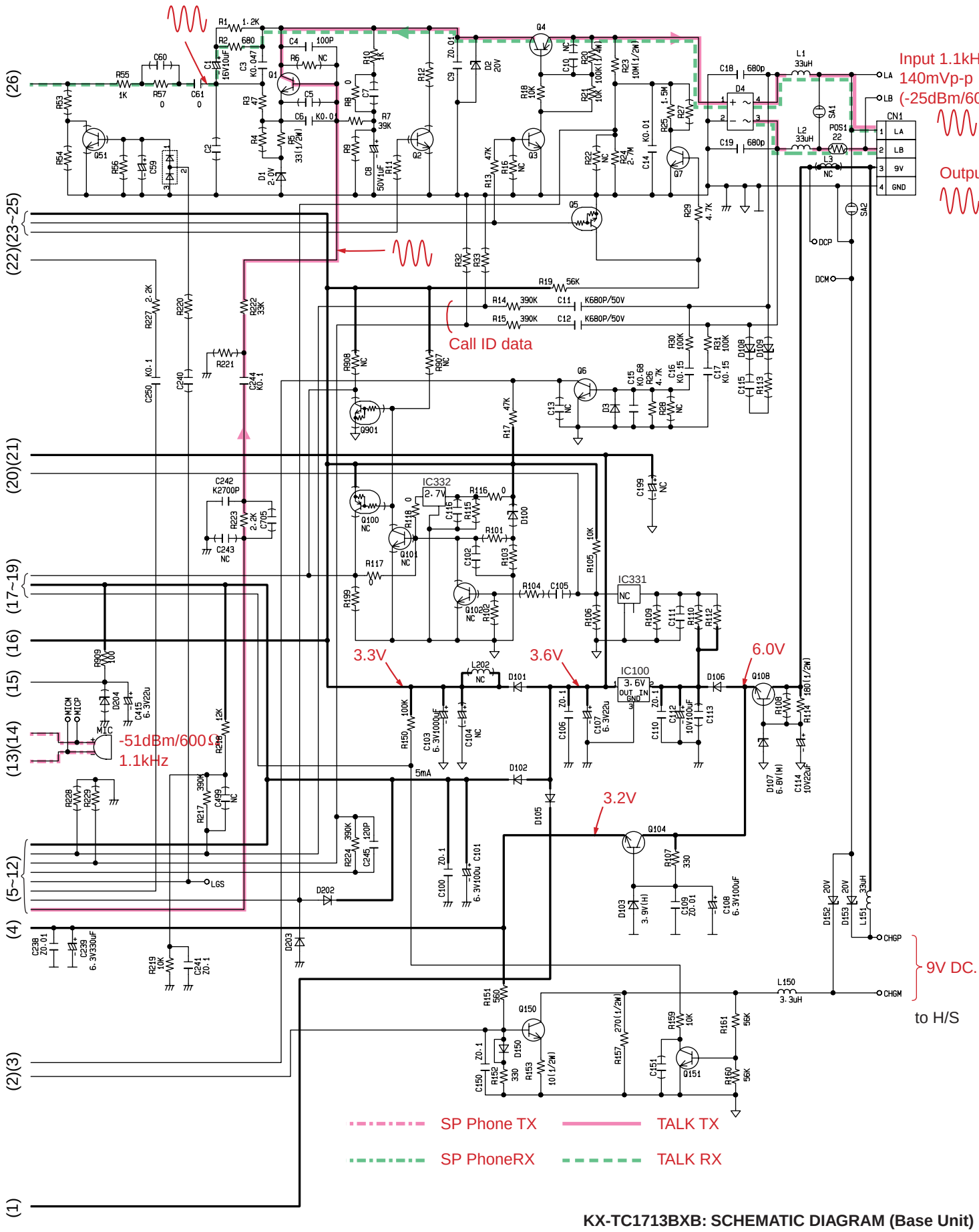
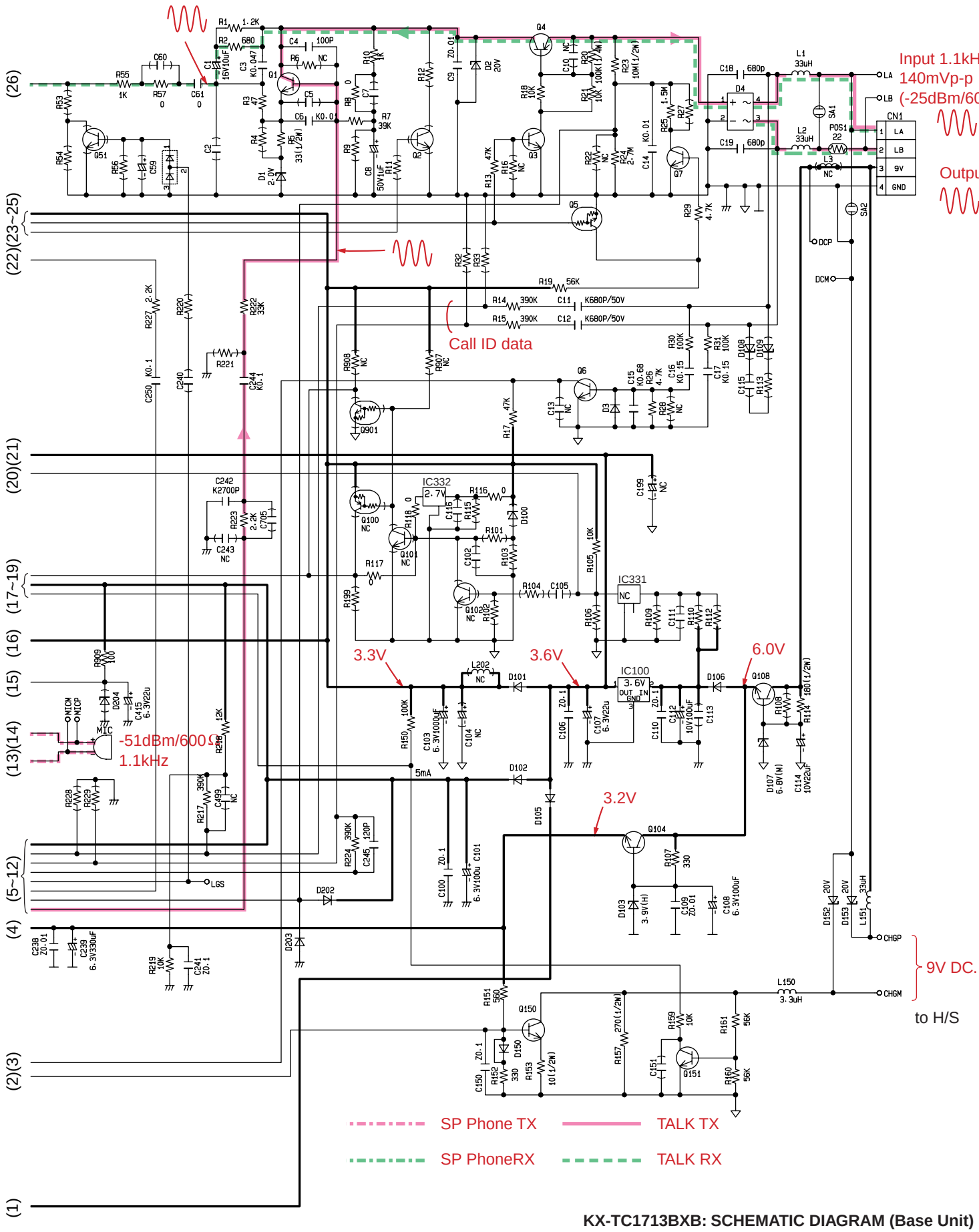
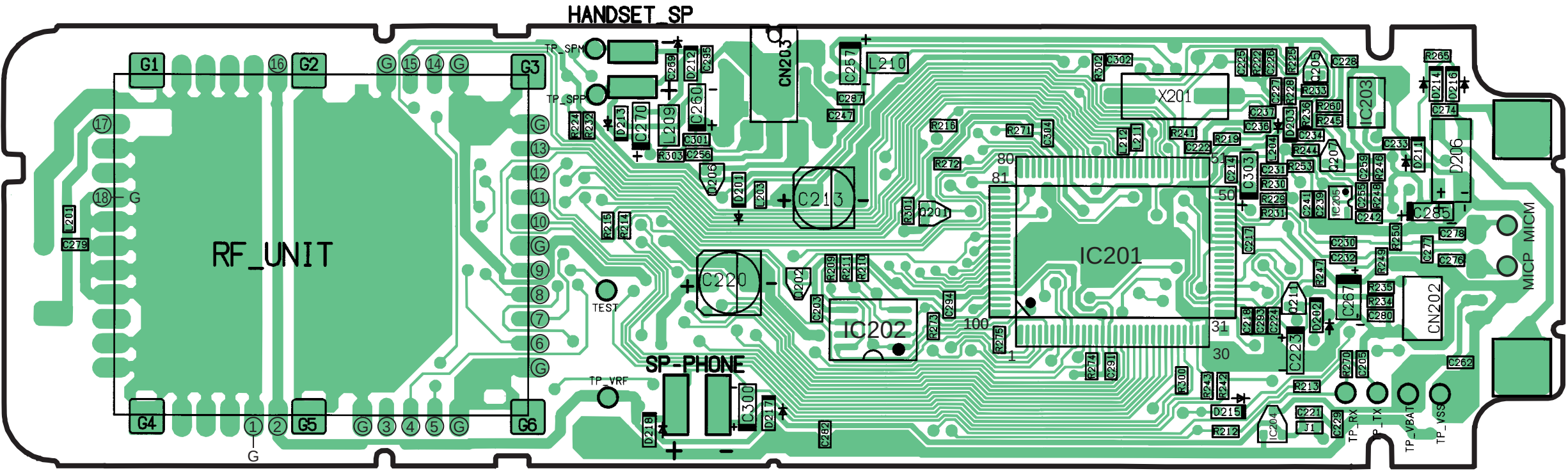
IC202
IC300
RFUNIT
ECN
LCD101
SP
(1)
(2)(3)
(4)
(5~12)
(13)(14)
(15)
(16)
(17~19)
(20)(21)
(22)(23~25)
(26)

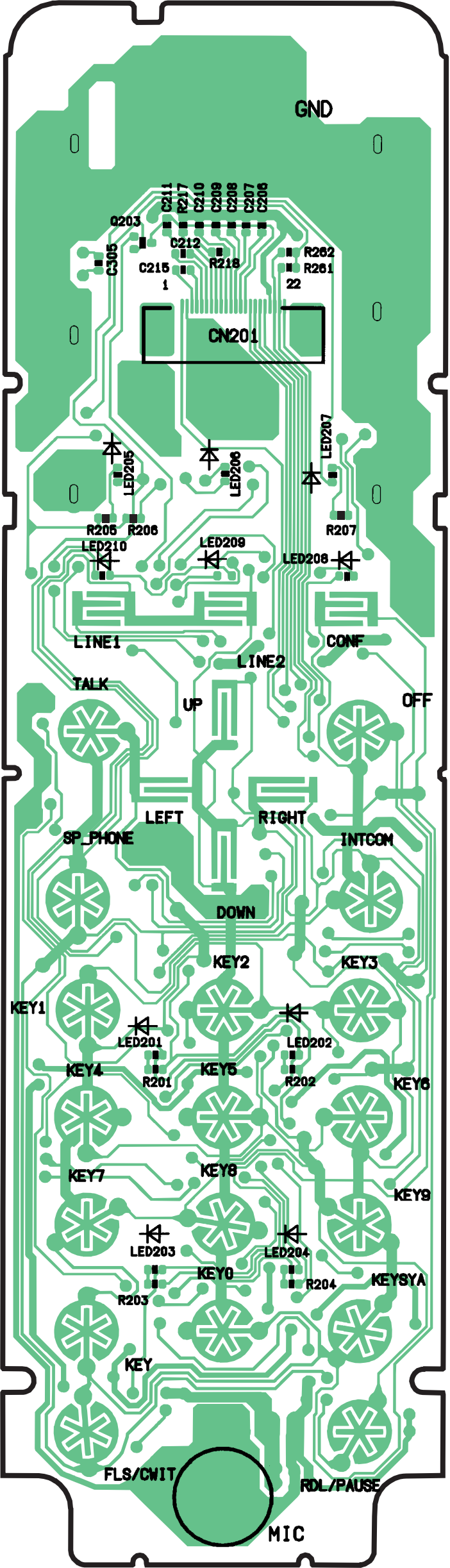


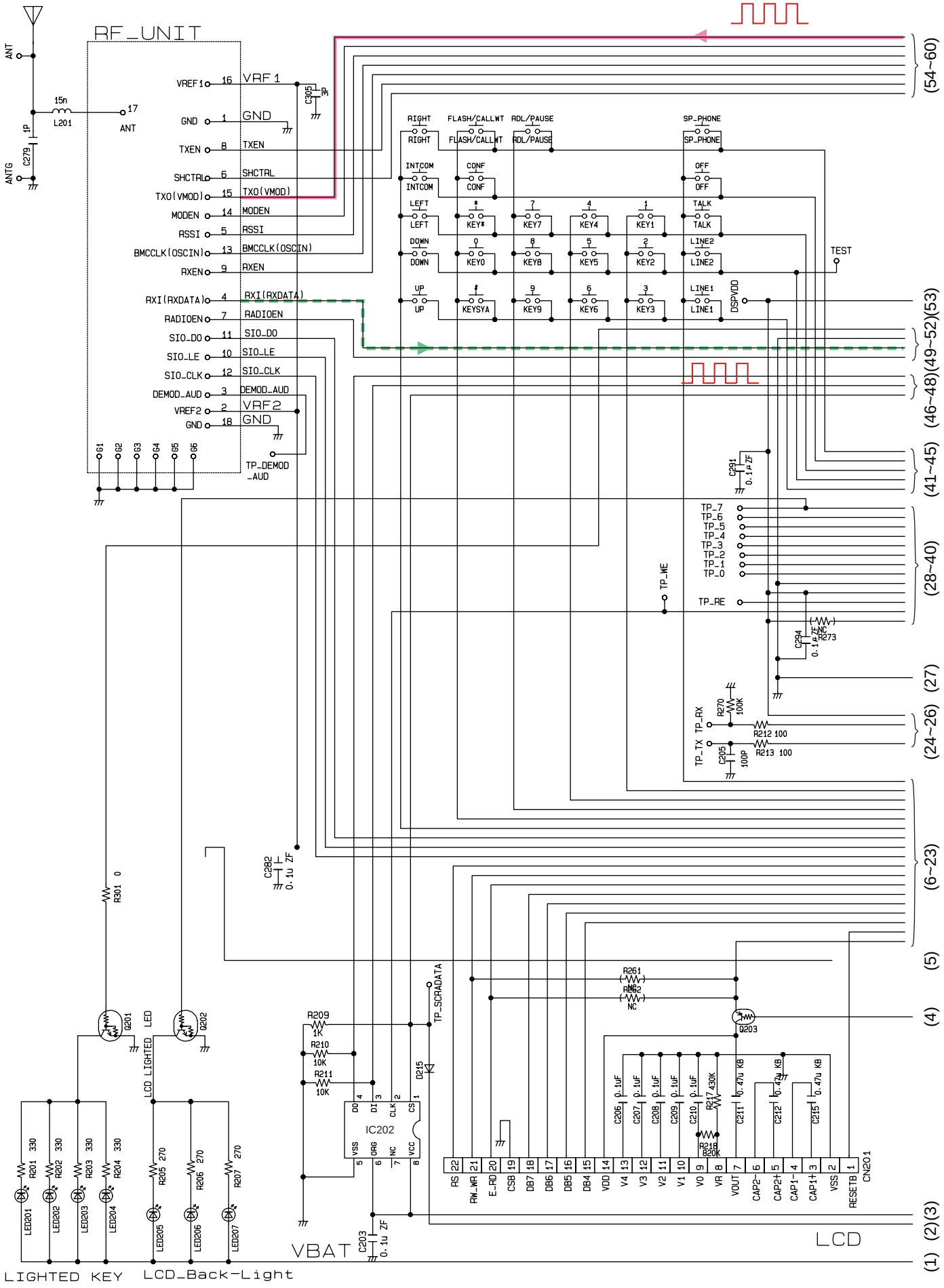
KX-TC1713BXB: SCHEMATIC DIAGRAM (Base Unit)

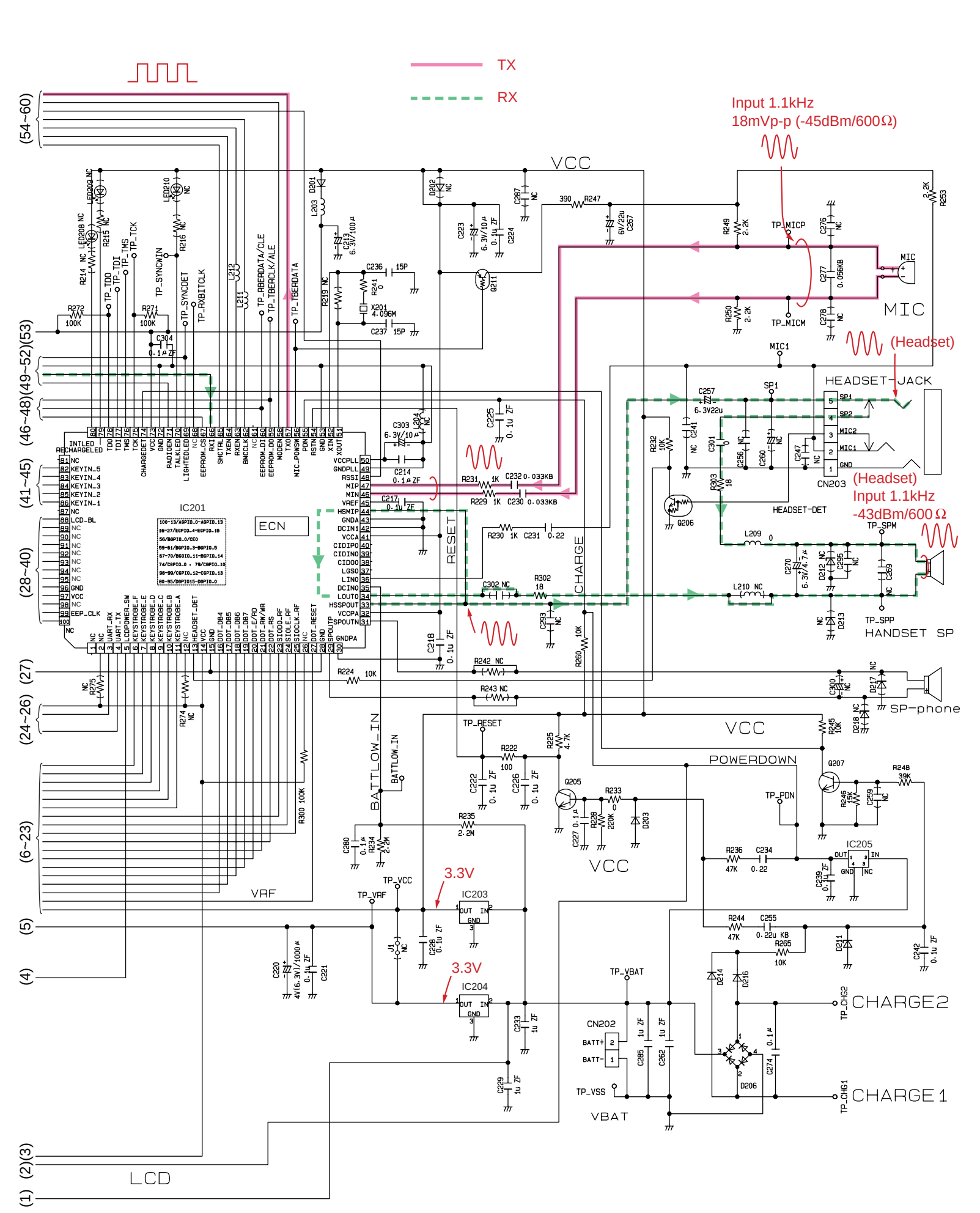


KX-TC1713BXB: SCHEMATIC DIAGRAM (Base Unit)

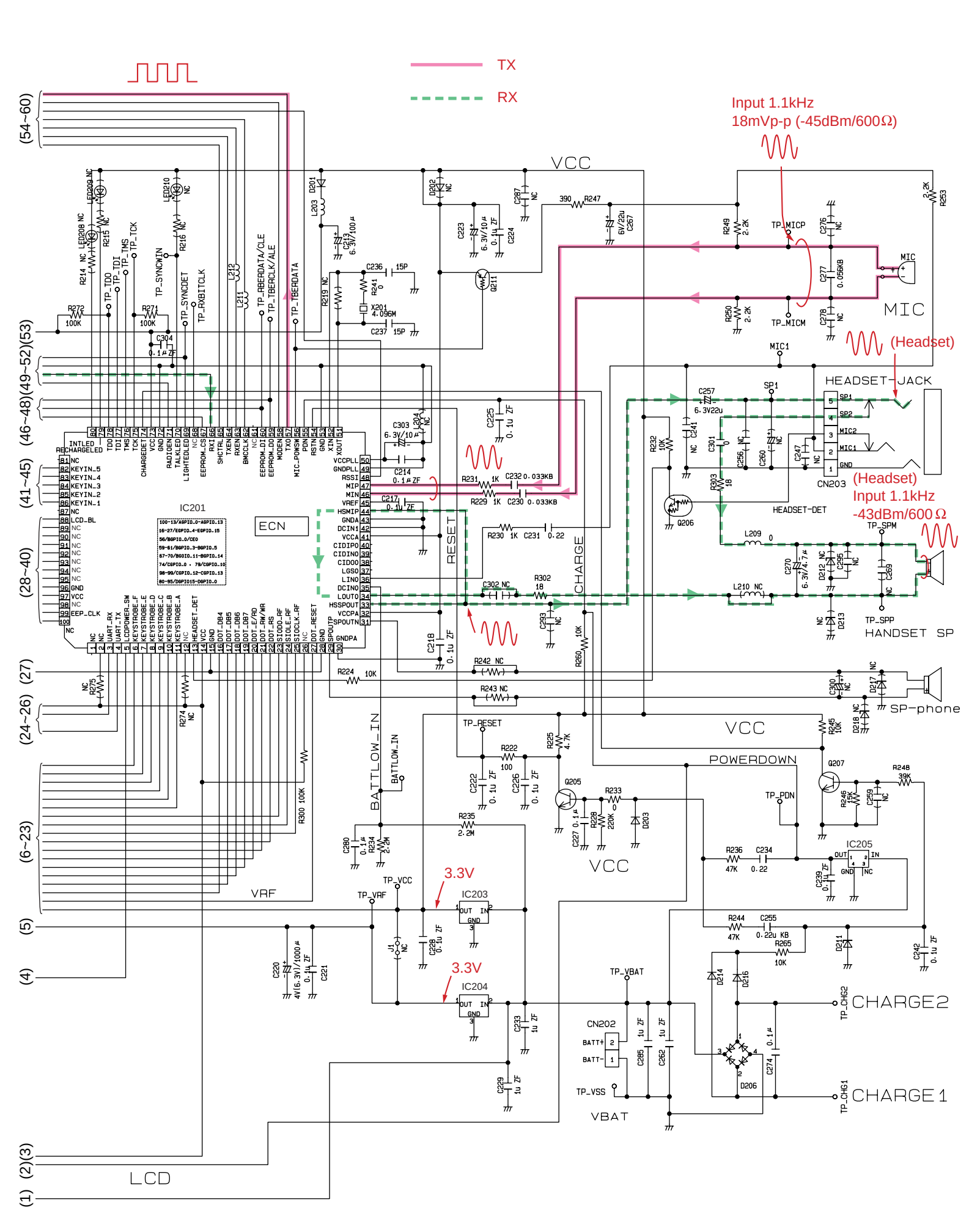

HANDSET_SP
RF_UNIT
SP-PHONE
TEST
TP_SPM
TP_SPP
TP_VRF
IC201
IC202
IC203
X201
CN202
CN203
MICP
MICM
TP_RX
TP_TX
TP_VBAT
TP_VSS
G1
G2
G3
G4
G5
G6


GND
C211
R217
C210
C209
C208
C207
C206
Q203
C305
C212
C215
R218
R262
R261
1
22
CN201
LED205
LED206
LED207
R205
R206
R207
LED210
LED209
LED208
LINE1
CONF
LINE2
TALK
UP
OFF
LEFT
RIGHT
SP_PHONE
INTCOM
DOWN
KEY2
KEY3
KEY1
LED201
LED202
KEY4
KEY5
KEY6
R201
R202
KEY7
KEY8
KEY9
LED203
LED204
KEY0
KEYSYA
R203
R204
KEY
FLS/CWIT
RDL/PAUSE
MIC


RF_UNIT
ANT
15n
L201
ANTG
C279
1P
VREF1
16
VRF1
C305
3P
GND
1
GND
TXEN
8
TXEN
SHCTRL
6
SHCTRL
TXO(VMOD)
15
TXO(VMOD)
MODEN
14
MODEN
RSSI
5
RSSI
BMCCLK(OSCIN)
13
BMCCLK(OSCIN)
RXEN
9
RXEN
RXI(RXDATA)
4
RXI(RXDATA)
RADIOEN
7
RADIOEN
SIO_DO
11
SIO_DO
SIO_LE
10
SIO_LE
SIO_CLK
12
SIO_CLK
DEMOD_AUD
3
DEMOD_AUD
VREF2
2
VRF2
GND
18
GND
TP_DEMOD_AUD
G1
G2
G3
G4
G5
G6
RIGHT
FLASH/CALLWT
RDL/PAUSE
SP_PHONE
INTCOM
CONF
OFF
LEFT
KEY*
KEY7
KEY4
KEY1
TALK
DOWN
KEY0
KEY8
KEY5
KEY2
LINE2
UP
KEYSYA
KEY9
KEY6
KEY3
LINE1
DSPVDD
TEST
C291
0.1uF
TP_7
TP_6
TP_5
TP_4
TP_3
TP_2
TP_1
TP_0
TP_WE
TP_RE
C294
0.1uF
R273
NC
R270
100K
TP_RX
TP_TX
R212 100
R213 100
C205
100P
C282
0.1u ZF
R301
0
LED
Q201
Q202
LCD LIGHTED
R209
1K
R210
10K
R211
10K
TP_SCRADATA
D215
IC202
DO
DI
CLK
CS
VSS
ORG
NC
VCC
R261
R262
NC
Q203
C206 0.1uF
C207 0.1uF
C208 0.1uF
C209 0.1uF
C210 0.1uF
R217 430K
R218 820K
C211 0.47u KB
C212 0.47u KB
C215 0.47u KB
RS
RW_WR
E_RD
CSB
DB7
DB6
DB5
DB4
VDD
V4
V3
V2
V1
V0
VR
VOUT
CAP2-
CAP2+
CAP1-
CAP1+
VSS
RESETB
CN201
LCD
R201 330
R202 330
R203 330
R204 330
R205 270
R206 270
R207 270
LED201
LED202
LED203
LED204
LED205
LED206
LED207
C203
0.1u ZF
VBAT
LIGHTED KEY
LCD_Back-Light
(54~60)
(49~52)(53)
(46~48)
(41~45)
(28~40)
(27)
(24~26)
(6~23)
(5)
(4)
(1) (2)(3)

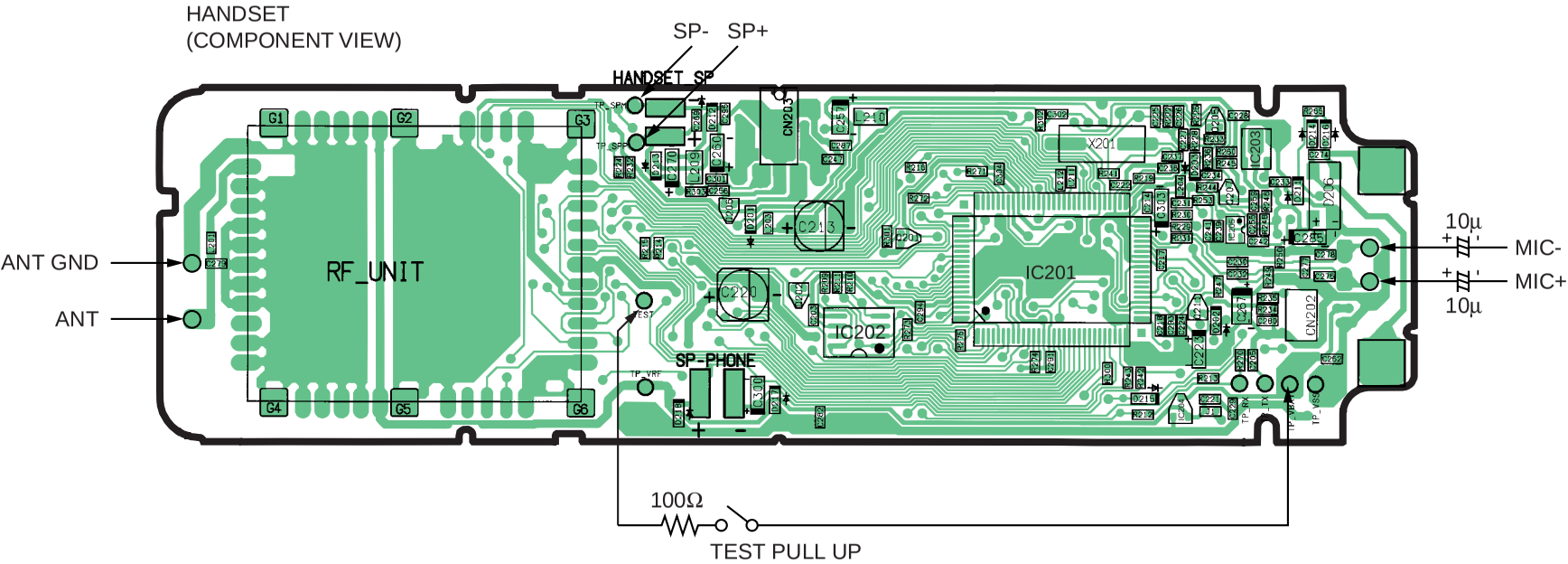


KX-TC1713BXB: SCHEMATIC DIAGRAM (Handset)

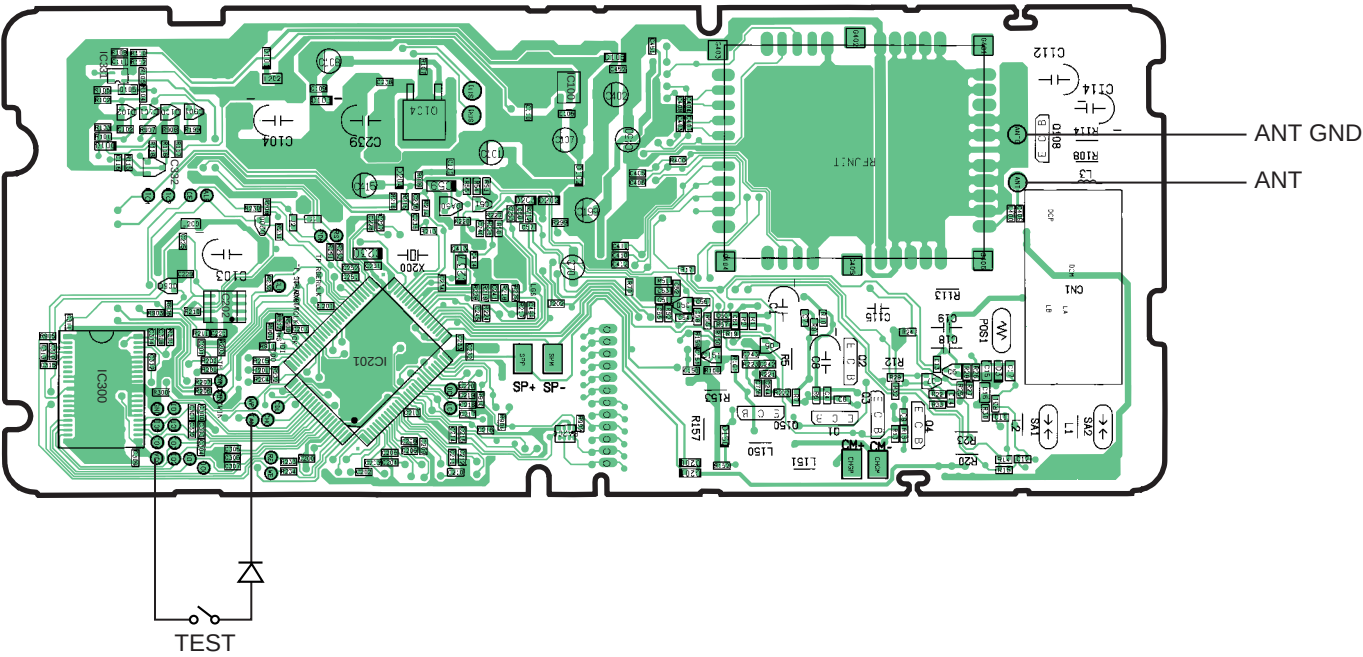


KX-TC1713BXB: SCHEMATIC DIAGRAM (Handset)

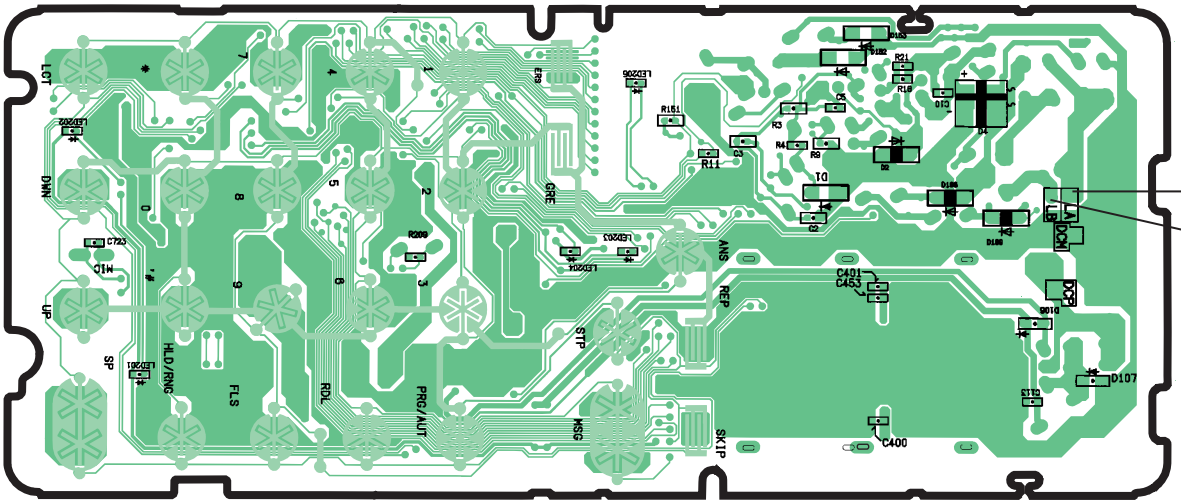
HANDSET
(COMPONENT VIEW)

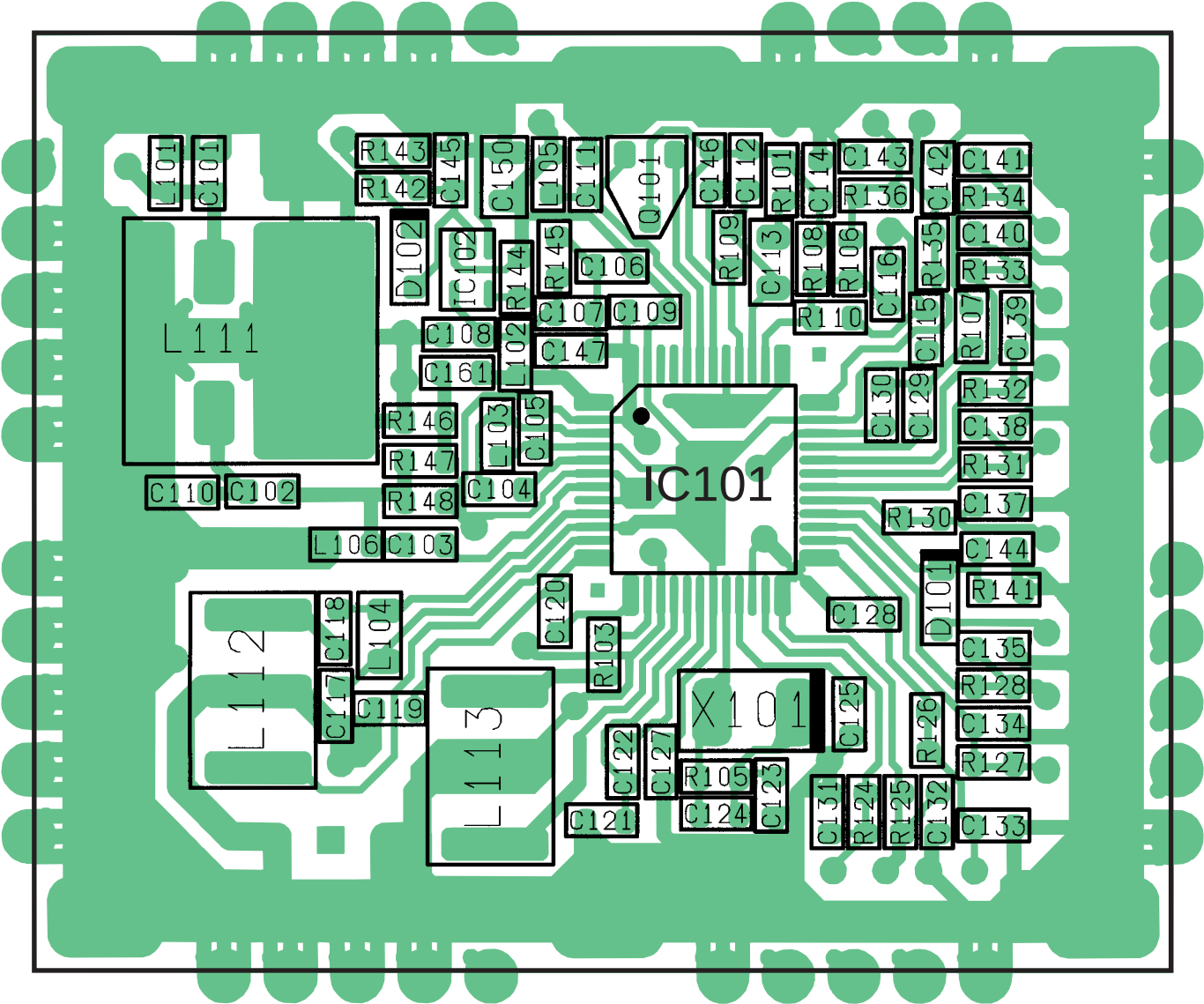


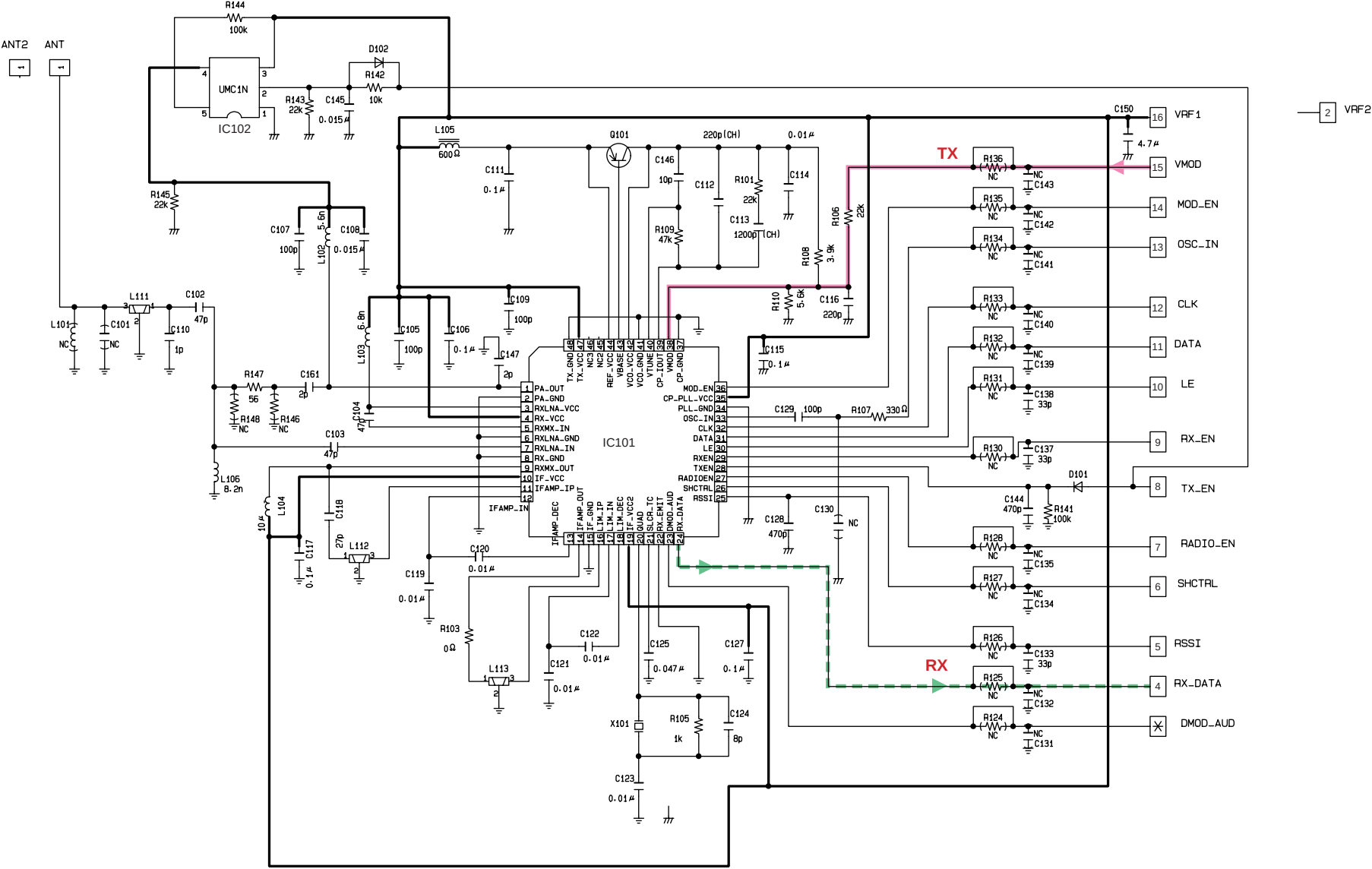
(COMPONENT VIEW)

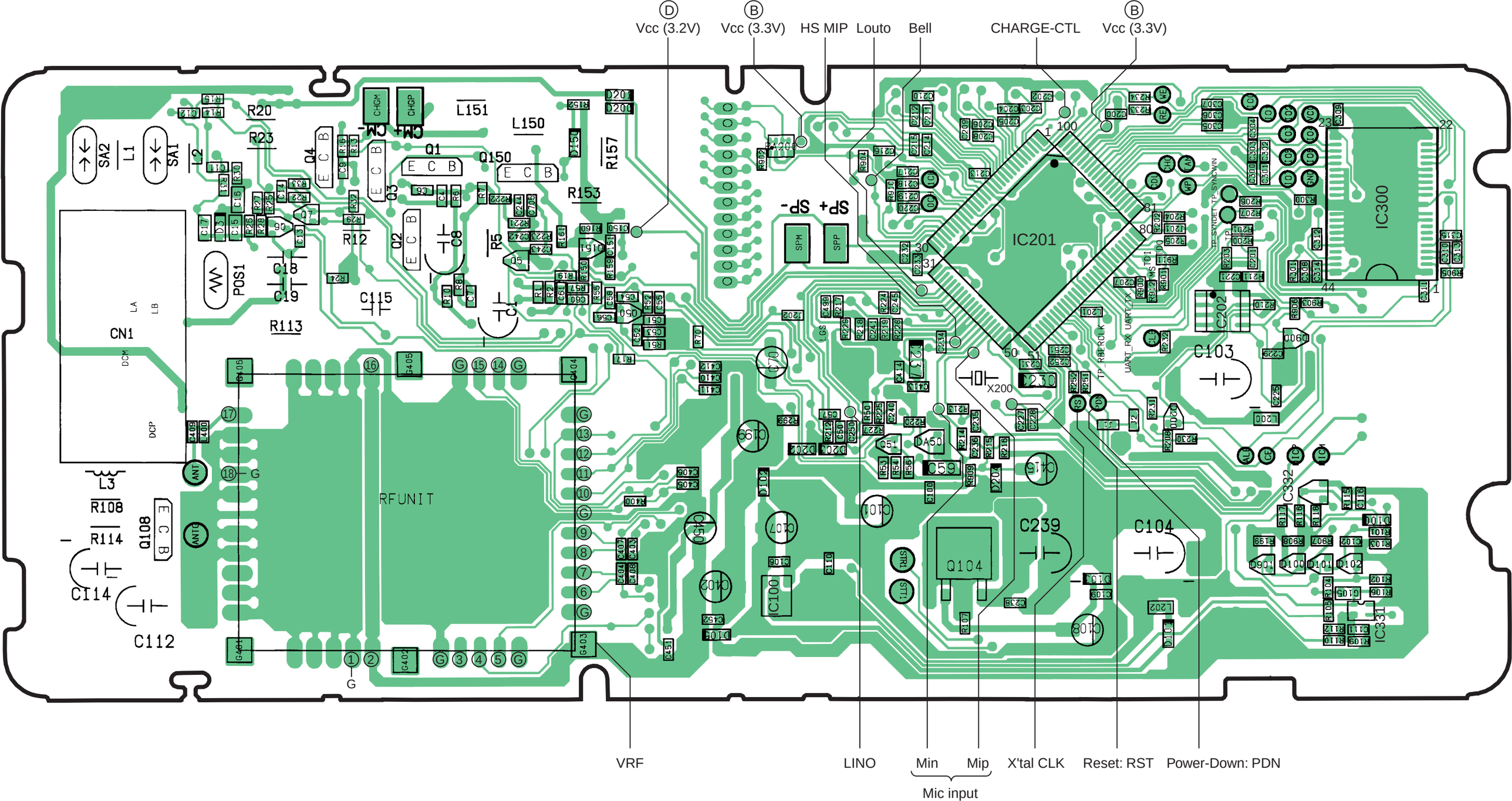


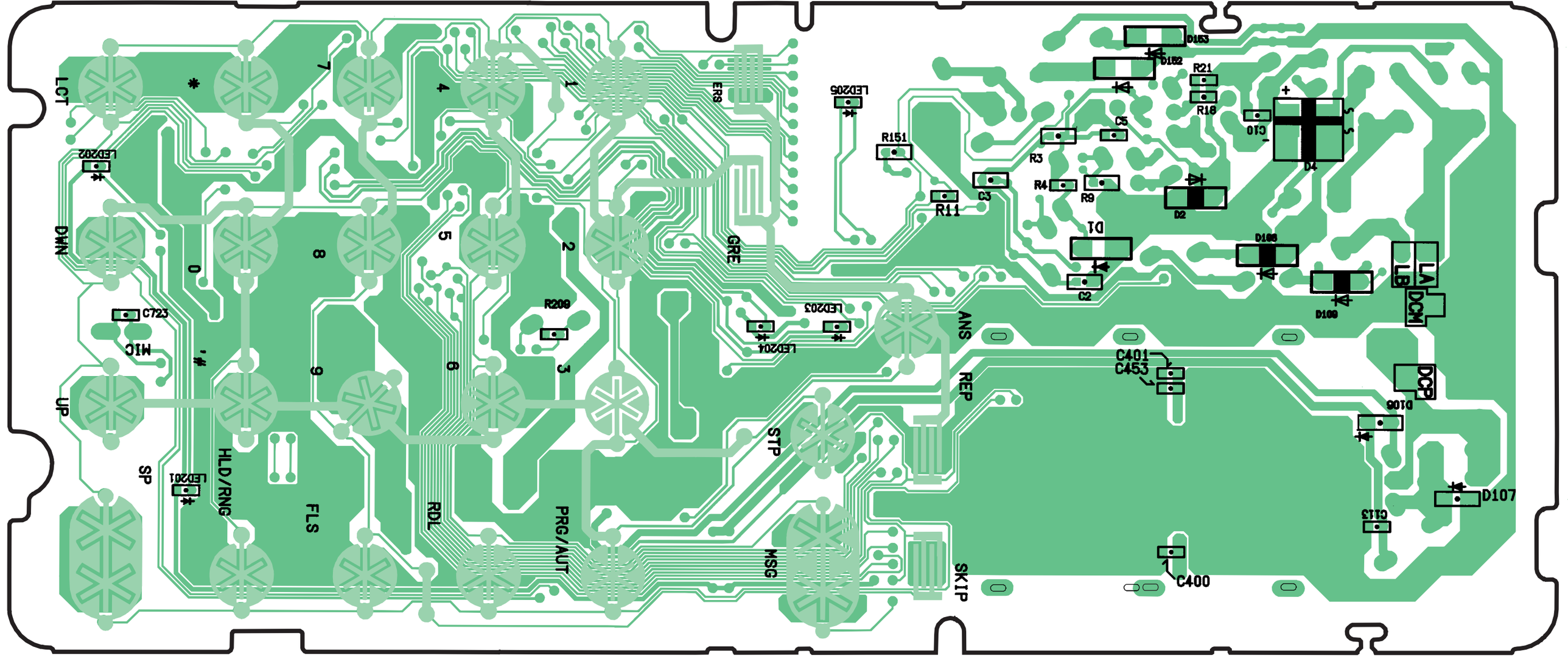
(FLOW SOLDER SIDE VIEW)




L101
C101
R143
R142
C145
C150
L105
C111
Q101
C146
C112
R101
C114
C143
C142
C141
R136
R134
C140
R133
C139
R107
C115
C116
R135
R106
R108
R109
C113
R110
D102
IC102
R144
R145
C106
C107
C109
C108
C147
C161
L102
L103
C105
R146
R147
R148
C104
C110
C102
L106
C103
IC101
C130
C129
R132
C138
R131
C137
R130
C144
R141
C128
D101
C135
R128
C134
R127
C133
R126
C125
X101
C120
R103
C118
L104
C117
C119
L112
L113
C122
C127
R105
C123
C124
C121
C131
R124
R125
C132


ANT2
ANT
R144
100k
UMC1N
IC102
D102
R142
10k
R143
22k
C145
0.015μ
L105
600Ω
Q101
220p(CH)
0.01μ
C111
0.1μ
C146
10p
C112
R101
22k
C114
C113
1200p(CH)
R109
47k
R106
22k
R108
3.9k
R110
5.6k
C116
220p
C115
0.1μ
C150
4.7μ
TX
R136
R135
R134
R133
R132
R131
R130
R128
R127
R126
R125
R124
NC
C143
C142
C141
C140
C139
C138
33p
C137
C135
C134
C133
C132
C131
VRF1
VMOD
MOD_EN
OSC_IN
CLK
DATA
LE
RX_EN
TX_EN
RADIO_EN
SHCTRL
RSSI
RX_DATA
DMOD_AUD
VRF2
R145
22k
C107
100p
L102
5.6n
C108
0.015μ
L111
C102
47p
L101
NC
C101
NC
C110
1p
C109
100p
L103
6.8n
C105
100p
C106
0.1μ
C147
2p
R147
56
C161
2p
R148
NC
R146
NC
C104
47p
C103
47p
L106
8.2n
IC101
PA_OUT
PA_GND
RXLNA_VCC
RX_VCC
RXMX_IN
RXLNA_GND
RXLNA_IN
RX_GND
RXMX_OUT
IF_VCC
IFAMP_IN
IFAMP_OUT
IF_GND
LIM_IP
LIM_IN
LIM_DEC
IF_VCC2
QUAD
SLCR_TC
RX_EMIT
DMOD_AUD
RX_DATA
IFAMP_DEC
MOD_EN
CP_PLL_VCC
PLL_GND
OSC_IN
CLK
DATA
LE
RXEN
TXEN
RADIOEN
SHCTRL
RSSI
C129
100p
R107
330Ω
C128
470p
C130
NC
C144
470p
D101
R141
100k
L104
10μ
C118
27p
C117
0.1μ
L112
C120
0.01μ
C119
0.01μ
R103
0Ω
C122
0.01μ
C121
0.01μ
L113
C125
0.047μ
C127
0.1μ
X101
R105
1k
C124
8p
C123
0.01μ
RX


Ⓓ Vcc (3.2V)
Ⓑ Vcc (3.3V)
HS MIP
Louto
Bell
CHARGE-CTL
Ⓑ Vcc (3.3V)
IC201
IC300
IC202
IC331
RFUNIT
CN1
Q104
Q108
X200
C103
C104
C239
C112
CI14
L3
POS1
SP+
SP-
VRF
LINO
Min
Mip
Mic input
X'tal CLK
Reset: RST
Power-Down: PDN


LCT
*
7
4
1
ERS
LED205
R151
R11
C3
R3
C5
R4
R9
R21
R18
C10
D153
D152
D4
D2
D1
C2
D108
D109
LA
LB
DCM
DCP
D106
D107
C113
C401
C453
C400
ANS
REP
SKIP
STP
WSG
PRG/AUT
RDL
FLS
HLD/RNG
SP
UP
MIC
C723
DMN
LED202
LED201
LED203
LED204
R209
0
8
5
2
9
6
3
,
#